

HOMEMADE GAMES

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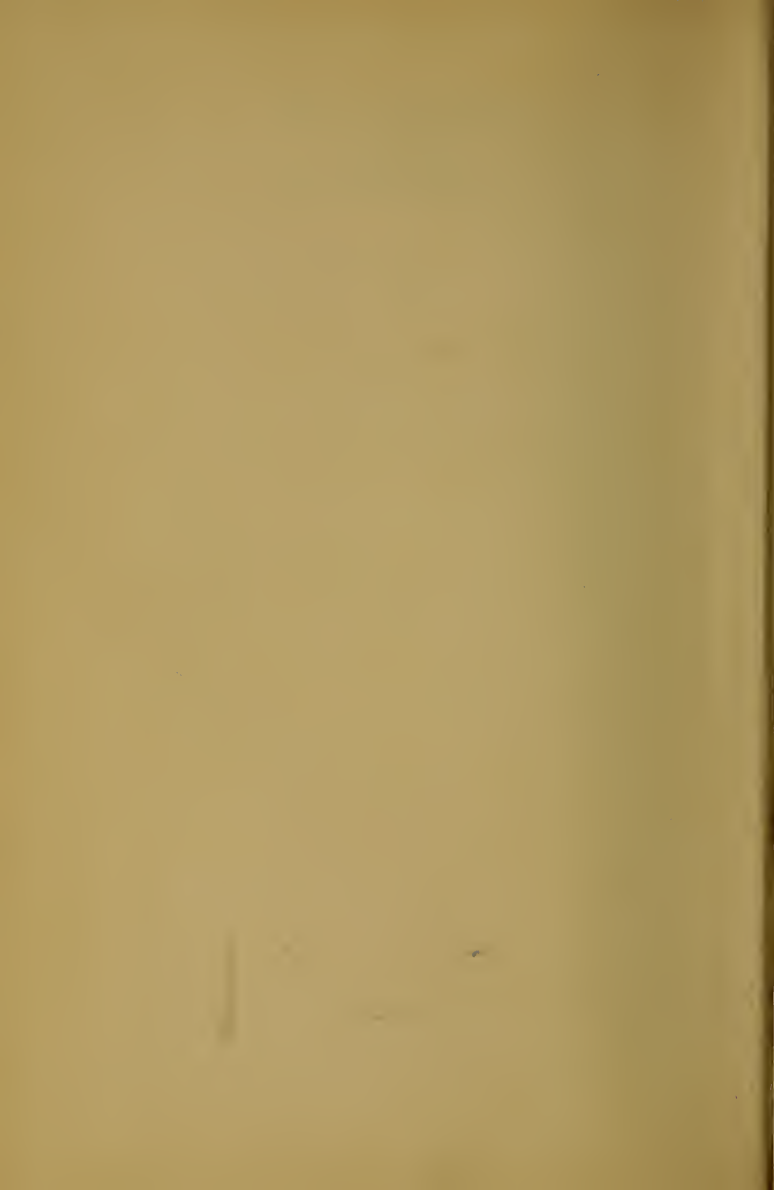
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HOMEMADE
GAMES





HOMEMADE GAMES

HOW TO MAKE AND PLAY
INDOOR AND OUTDOOR
GAMES

BY
ARTHUR LAWSON

*WITH A FOREWORD BY
ANGELO PATRI*

37 ILLUSTRATIONS

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TO MY FATHER

W. ELSWORTH LAWSON

WHO TAUGHT ME THE USE
OF TOOLS, AND THE FUN OF
MAKING THINGS WITH THEM

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FOREWORD

BY ANGELO PATRI

THIS is a valuable book for boys and boy-leaders. It is a bookful of recipes for enjoyment of leisure. A chart for shopwork teachers, camp directors and club leaders who are searching for interesting things for boys to do. Here they are, warm from the heart and hands of a young man who worked out each game and played it.

All boys and girls enjoy playing games, once they get started. Getting started is not so easy. Somebody says, "Let's have a game of Holo-holo" and somebody else yawns and says, "Oh, it's too hot, I'm tired. Wish something would turn up that a fellow liked to do."

Creating things is what makes them full of lively active interest. What you do becomes part of yourself, and how we do like ourselves and what belongs to us. How deeply interested we are in all that we can label "Mine."

Creation is our actual right to possession. What we make is our own. Nobody can ever take it away. The material part of it may pass but its reality stays to enrich its creator for all time. That is why a book that tells boys how to make games is worth its weight in angels.

Making one's own games will not always be cheaper in terms of money than buying them, but making them enriches the mind and the body of the craftsman, and so touches his life with the magic of happiness. There is pride and joy in the heart of the boy who says, "Let's have a game of checkers with my own set. I made them myself."

There's an assertion of self-supremacy, of self-sufficiency in that invitation that speaks well for physical and mental health.

We have come upon days that offer time and impose the necessity for self-culture, self-reliance, self-sufficiency. Each of us must turn now to himself for sustenance, happiness and peace. Since time began Man has turned to the work of his hands and the power of his mind for relief and escape. Play offered escape and now that our play-time has been greatly extended there must be ways and means and the full use of creative intelligence. This book that teaches the way and indicates the means is both timely and essential.

So I second the author of this book, a camp-trained boy, who found joy in making his own games. To all those other boys who long with a great longing to do something, to have something, to use something that is their very own he offers a way. I hope that this way will be opened to them by all those whose duty and privilege it is to lead boys.

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HOMEMADE
GAMES





INTRODUCTION

EVER since I can remember I have always liked making things, not just anything that happened to occur to me, but something that I could use right away, or something that my family or friends would find pleasure in. Sometimes it was a bookcase or a birdhouse, sometimes a boat, or a shack in a tree, and once a tent on a raft that I anchored in the middle of a mountain-encircled lake in Maine. But generally I made games, games that were fun to build and fun to play, games that everyone could enjoy.

The early ones were rather crude affairs that soon fell apart. But later on, as I grew older and learned to use the few tools in our family chest the games grew in number and improved in quality. There were games for the open fields at camp and the small back yard in town, quiet games for winter nights at home, and active ones for parties. We all liked to play games wherever we happened to be, and the ones we liked best were those that we made.

I have always stayed by one principle since those first rough little toys: the simplest way to make a game is the best. The simplest tools are also the best, and you will need no fancy ones in making the games described here. A saw and a hammer, a brace with a set of bits, a square, a smoothing plane, a yardstick, a screwdriver and a jack-knife. You may need a few additional tools for some games, but not many. And most people if they have any workshop at all are better equipped than I, for I'd rather

use an axe and a jack-knife than the most alluring tools in all the glittering hardware catalogs.

The materials, too, are all of the simplest. I haven't told you much about the best kind of wood to use in making these games because it varies so much in different parts of the country. Most of the games can be made of scrap lumber, but if you want to do a better job you can buy the wood in your local yard. Tell the mill manager what you are thinking of making and ask his advice on the best wood to use. He may have the wood that I suggest, or he may have something that will better suit your purpose. But always insist on good clear wood that is well seasoned; green wood may shrink or check and ruin your game. You won't have to buy the most expensive wood in the mill. The cheapest may often be the best.

Most of these games can be built in three or four different ways. I have described only the best way, with bought lumber and careful work. But you can make them all with scraps and cheaper wood, and you can have a lot of fun playing a game made from the bottom of a soap box. If you are dubious about a game, afraid that you won't enjoy it, it might even be a good idea to build it of wood from a packing-box. Then, after you have played it for a while, you may decide to make a new one with the best craftsmanship and the finest materials.

Before you make any of the games here read the text and look at the pictures, and be certain that you understand what it is all about. Then you may think of another way of making the game, a way that will please you more or better fit your needs. Most of the games that I have de-

scribed were built without any specifications at all, and all of them were made to please the builder. So if you want to vary them don't hesitate, and if you think you have a better idea try out your own. One of the chief joys of building homemade games is that you can put your own personality into them. You can make them *your own* games.

When you are hunting for a game to make first look to its use and then to the difficulty of building it. Very few of these games are hard to make, and you should really have no trouble with any of them. But, unless you are going to make every one in the book, you will want to pick out the one that will give you the most pleasure. Some of the games are intended for outdoors, and some for inside. There are games for two and four players, puzzles which you can enjoy by yourself, and games that can be played by a large group. Many which are normally outdoor games can be brought inside, and with most of those which can not I have given a smaller version that is just as much fun to play but takes up less space. The descriptions of each game will give you all the information that you will need. Check them over before getting to work.

Some of these are old games that you may have played all your life; some may be entirely new to you. But don't be afraid of the new ones. They have all been tested and tried, and those that were found wanting have not been included. Every game here has been popular at home or in camp, in clubs or on the playgrounds.

There is one game that is more fun than any of the others. It is the game of making games, the best game

that I have ever found! It is the game of getting fun twice from every game that you build, the fun of making and the fun of playing.

That is why I have included a few games that are really hard to make. That is why I put in Chess, the most complicated and difficult of all to build. I have spent many hours playing the game; and many happy hours making sets for it. I sometimes wonder which I enjoyed most: learning the intricate moves, playing the unusually interesting game; or the long hours I have put in carving out the fine little men. It is hard to say, for there are two different kinds of pleasure involved. The playing was stimulating and entertaining—but making the game brought the greatest satisfaction, and as it grew piece by piece I felt the thrill and joy of creation.

CHAPTER I

SHUFFLEBOARD

SHUFFLEBOARD is a very old game that was popular as long ago as in King Henry the Eighth's time. In those days the Shuffleboard court was a truly remarkable and expensive piece of furniture, a "table ten yards one foot and one inch long, made up of two hundred and sixty pieces of wood about eighteen inches long . . . joined and glewed together."

But as the years have passed the game has been simplified a bit. There is no need today for such a complicated piece of equipment, no need to "join and glew" two hundred and sixty pieces of wood. Concrete driveways or walks, playgrounds and tennis courts, almost any hardwood floor or gymnasium, cellar or ship deck will provide ready-made playing grounds for the standard game of Shuffleboard, and for the smaller but no less interesting game even sitting-rooms or hallways are appropriate.

Yes, Shuffleboard is an old game that has lived long and has a much longer life ahead of it. The great shipping companies dug it up out of the past for the amusement of their passengers and now it has been born again. It has all the advantages of popular games. The basic rules are easy to learn, anyone can play it with fair success, but to be really good takes skill and practice. The outdoor game is an interesting summer sport, and as in the time

of Henry the Eighth the indoor game will liven up many a cold winter's evening.

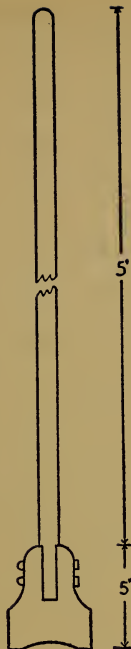
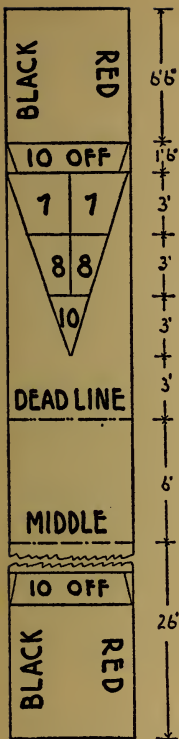
The pieces used in Shuffleboard can be used for many other games. With a little ingenuity you can play a sort of Shuffleboard-Skittles by setting up tenpins and shooting at them with Shuffleboard disks. Or you can use the disks in Exo and Bull Board, and the cues in a modified Croquet. That's one of the best things about most home-made games; you can make up many new games by combining two or three old ones!

The equipment is not complicated, but the cues or pushers, the disks and targets give plenty of variety for different kinds of craftsmanship. Here I'll describe for you an outdoor, an indoor, and a miniature set, each a great game in its own sphere. The big game comes first.

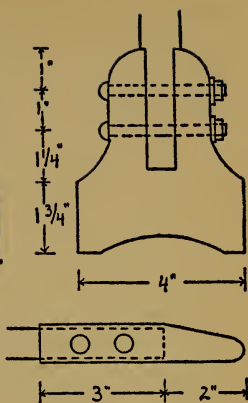
MATERIALS

For the big, four-player set you'll not need many materials and all are cheap and easy to get. At the lumberyard pick out some clear white pine or hardwood measuring 1" (inch) thick, 4" wide and 20" long. This is for the cue or pusher and if it is only $\frac{3}{4}$ " thick when planed it will not matter. The pine will be easier to work. The hardwood will be more durable. You'll have to decide for yourself which of these two qualities you prefer: pine if you haven't worked much in wood; maple if you are an accomplished craftsman and want the best.

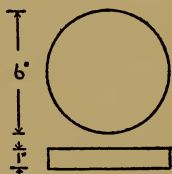
For handles you'll need either four 5' (feet) poles about 1" in diameter, or a 5' board 1" thick and 5" wide. Any tough hardwood will do if it is straight-grained. You can



Cue



Cue Detail



Disk

SHUFFLEBOARD

cut all your disks from one 6' piece of maple 6" wide and 1" thick. Eight carriage bolts $2\frac{1}{2}$ " long with eight nuts to fit and sixteen washers, a small can of red paint and a small can of black complete the list.

CUES OR PUSHERS

Take the 1" by 4" by 20" piece of hardwood and cut it into 5" lengths. With a compass-saw shape as shown in the diagram, and then with a back-saw cut a deep $2\frac{1}{2}$ " mortise $\frac{3}{4}$ " wide as shown. With a plane or chisel bevel off one side of each cue-head to a point 2" from the front, and round off the front end slightly as shown.

If you bought round sticks for the handles the rest of your job is simplified though not very interesting. Just finish off the top ends so they look nice and cut the bottom ends to fit in the mortise in the cue-head. But if you've bought the flat board and are going to make handles from that you'll have a harder job but will produce a better-looking and stronger cue. Saw the 5' hardwood board into four 1" by 1" by 5' pieces. Starting about 6" from one end round off each stick with a spokeshave or plane and trim the top end as shown in the diagram. Now cut the square end to fit into the mortise and go on with the next step.

You'll have to be very careful now. If you have a vise, set one of the heads in it with the handle in place. Be sure that both are secure and will not move. Then, being careful to do it straight, bore two holes through the sides of the head for the bolts. See the dotted lines in the diagram. Make the holes just large enough to take the bolts

snugly. Now put on the nuts and bolts and washers as shown and tighten them securely. Finish the other three cues and sandpaper them all smooth.

Paint two of the cues black and two red according to your whim. Either paint the entire cue, or the head, or better yet just a $1\frac{1}{2}$ " circle around the handle near the head. When they have dried, varnish them all over.

THE DISKS

With a compass-saw cut twelve disks from your 6' piece of maple. The disks should be 6" in diameter and as nearly 1" thick as possible when finished. In the center of each disk bore a hole about $\frac{1}{8}$ " or less in depth and the size of your biggest bit. On the other side of each cue bore a similar hole. Sandpaper the disks carefully, rounding all edges before you paint them.

The neatest and most satisfactory paint job is the easiest. Just paint the interior of the small depressions you've bored in the disks. The paint there will not wear off with use and you will always know whose disk is whose. If you'd rather you can paint the whole disk, then varnish it, then wax it. You will need six black disks and six red ones.

THE COURT

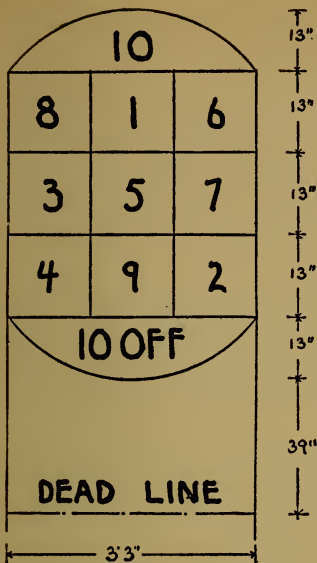
I've given you two diagrams for Shuffleboard. The one with the points seems to be the most popular on land and the one I've called Deck Shuffleboard the most popular on shipboard. Why there should be two courts that have become popular in two different places I don't know. But

the game is a bit different with each court and I'll try to explain it so that you can take your choice.

The land game comes first. You will need a fairly large area for this game, a hardwood floor or a concrete surface 6' wide and 52' long. The length is not absolutely necessary and you can adjust it a bit to fit your area. The diagram gives the regulation measurements. If you must cut down on them, either change the whole thing in proportion or take out length between the two dead-lines.

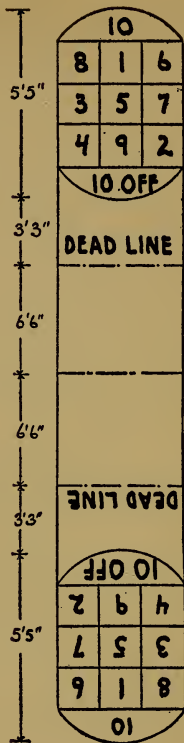
Paint the diagram on your playing surface with black or white lines. If you don't want permanently to mark up your best front walk draw the diagram with chalk or paint it on with calcimine. But if you are going to play Shuffleboard on a playground or the driveway or in the cellar the lines will give character to an otherwise plain-looking surface. You can paint the scoring area red and the "10 Off" area green and the dead line black and the middle line red and get quite a gay effect.

The Deck Shuffleboard court is made in the same manner as the one described above with the single exception of the difference in design. It is smaller, 3' 3" wide and about 42' long. But if you add the square area to stand in, it will become almost the same length as the land game. The main difference between the two is in the scoring. The Deck Shuffleboard allows for a sequence game as well as the regular one. But I can see no reason at all why you can't have both at once, be a landlubber and an old tar at the same time, so to speak. At one end of the court have the land game, at the other end have the deck



Goal Detail

DECK SHUFFLEBOARD



game enlarged to 6' in width. Then you can take your choice as to which you'll play.

RULES FOR PLAYING

Shuffleboard is usually played by partners, but if there are only two of you the game can still be played. Just leave out Rule 8 below, retrieve your own disks and shoot them back yourself. The rules below are for the four-handed game.

1. Choose partners either arbitrarily or by shooting from the 10 Off space. The player getting nearest to the opposite 10 Off plays with the person third nearest. The second is paired with the fourth, and the play is in the same order.

2. When partners have been determined 1 and 2 take their positions at one end of the court and the other two at the other end. 1 and 3 are to play Red, 2 and 4 to play Black. 1 and 2 have all twelve disks at the start, six apiece. 1 leads with a red disk, 2 follows, then 1 plays again and the sequence is followed until all twelve disks are played.

3. The disks are pushed with the cues, each player having a cue the color of his disks. A player can give as vigorous a push as he wishes providing the cue does not pass the 10 Off area, and providing he does not step out of the playing area. If either of these fouls are committed the disk is dead for the remainder of that inning and the second player takes his turn.

4. If the disk does not pass the opposite dead line it is dead for the remainder of the inning and is taken off the

court. But if it does pass the dead line it is left in position for the rest of the inning.

5. The object of the game is to score by shoving the disks onto the scoring area at the opposite end of the court. It is permissible to hit any resting disk with a played disk. Scoring is done at the end of the inning. Thus: if a player, say #2 (Number Two), has a disk on 8 and #1 strikes it with his disk and knocks it off the scoring area it does not count towards the score unless it is knocked back on again in the course of play.

6. A disk counts the number of points indicated by the space it is at rest on at the end of the inning. If it is on a line it counts for the larger number. If it is on the line of 10 Off, or in the space marked 10 Off it subtracts 10 from the total score.

7. All dead disks and all disks that are not at rest on a numbered space at the end of the inning, do not count in the scoring.

8. When 1 and 2 have played all twelve disks the inning is ended and the score added. Then 3 and 4 retrieve the disks and play. The round is continued until the end of the game.

9. The game ends when a previously determined score is reached, or when a previously determined number of innings has been played. 51 points usually constitutes the game. But if you prefer you can play six or eight innings and the high score wins.

10. The above rules apply to both Land and Deck Shuffleboard, but not to the game called "Sequence Shuffleboard."

SEQUENCE SHUFFLEBOARD

Sequence Shuffleboard can be played only on the Deck Shuffleboard court. Except for the scoring all the rules given above still hold. Rules 1, 2, 3, 4, 5, and 8 are unchanged. The new rules are given below.

1. The object of Sequence Shuffleboard is to place the disks in sequence on the numbered squares from 1 up to 10 and back again to 1.

2. The player's partner takes up the game where he left off. Thus: if #1 went to 5 on his first play #3 would begin with 6.

3. If a player should land a disk on 10 Off he must go down a point. Thus: if the player had reached 7 and hit 10 Off he must hit 7 again before he proceeds.

4. The scoring is taken at the end of the inning and no disks count that are not in the proper order. But if a player has reached 5, let us say, by the beginning of the inning, then places 7, then 6, and the 7 and 6 are still standing at the end of the inning, they both count and the partner must start on 8.

5. When the end of the game is reached the score is determined by adding the number of points won. The winning team would then have an even 100 and the losing team 100 less the total of points not placed.

JUNIOR SHUFFLEBOARD

The Junior set is cheaper than the regulation set because it takes less material. But it is just as hard to make and requires just as much skill to play. The best set is

just half the size of the regular game. But if your indoor playing area is still too small you can cut down the dimensions even more and still have a satisfactory game. Junior Shuffleboard is a fine game for a fairly large living-room or hall, or for most modern cellar play-rooms.

MATERIALS

Since the set is half the size you will need just about half the lumber. The disks can all be made from a piece of maple $\frac{3}{4}$ " thick, 6" wide and 19" long. The cue-heads are made of 3" by $\frac{3}{4}$ " by 16" maple, and the handles from old broomsticks or four $\frac{5}{8}$ " by 36" dowels, or a straight-grained hardwood board $\frac{3}{4}$ " thick by 4" wide by 36" long. To complete the list you'll need some 2" finishing nails, a small can of glue, and a bit of red and black paint.

THE CUES AND DISKS

Make the cues like the larger ones described in the section on the making of cues. The heads should be 3" wide and 4" long, and the handles 36" long. Fit the handles to the heads either as shown under the regulation game or as shown under Table Shuffleboard. If you do make them as in the big game fasten them together with the finishing nails and glue instead of the nuts and bolts. Sandpaper and paint the cues as described on page 29.

With a keyhole-saw cut out the twelve disks from the piece of $\frac{3}{4}$ " by 6" hardwood. They should be 3" in diameter and $\frac{3}{4}$ " thick when finished. Cut indentations in each side, sandpaper and paint the disks as described for the large game.

THE COURT

If you have a good playing surface mark out the court with $\frac{1}{2}$ " black or white lines, cutting all dimensions given in half. This will give you a court 26' long and 3' wide for the land game. For the Deck Shuffleboard cut the dimensions by only one-third on the targets and by one-half on the alley. Cutting the target in half will make it too small.

You may not want to mark up your best hallway and if you make a movable court you will not have to. The portable canvas court is a bit expensive for many people but can be used in so many places it is almost invaluable. A cheaper court can be made from plain oilcloth if you don't want to go to the expense of canvas. You can use either court almost anywhere. You can even stretch it between two rooms, and by placing newspapers under it to even the slope over the threshold, you can play Shuffleboard where the game would otherwise be impossible.

For the canvas court you will need a piece of fairly heavy white canvas a yard wide and nine yards long. Get double-filled canvas or heavy oilcloth. The canvas will have a selvage down both sides so you will only have to hem the ends. I suggested that you get a piece about a foot too long for the court. This allows for the hem and 8" to spare. Cut off the 8", cut it into triangles, and sew the triangles into the corners of the main piece for reinforcement. Sew a buttonhole or grommet into each corner if you have used canvas. Then, when you are playing you can stretch the canvas tight with ropes tied to the corners

and to rocks or stakes or furniture. If you have made the court of oilcloth don't try to put in grommets. They will pull right out!

Oil paints run badly if put directly on untreated canvas but they will not run on the oilcloth. You can "size" the canvas by first painting the back-side with one coat of plain white paint. Then when you paint the top surface it will not run. Mark out the court with $\frac{1}{2}$ " black lines and paint the scoring areas any color that suits your fancy. When the paint has thoroughly dried sprinkle floor-wax over the top of the court and rub it in thoroughly. If you have used oilcloth this will not be necessary as the surface itself is slippery enough.

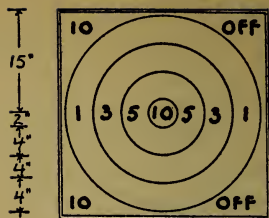
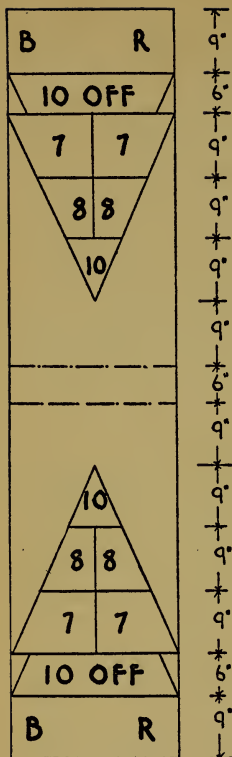
PLAYING THE GAME

Stretch the court out, being careful to remove any obstacle that would cause bumps. If you are playing inside, the carpets will not bother the game much if the canvas is tight and you place newspapers under the court to give it a gentle slope to the floor. If you want to play outside you can peg the court down on the lawn or sidewalk.

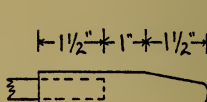
The rules are the same as for the big game with one exception. It is not necessary to stand inside the playing area. But when you are pushing the disk you must not move the cue out of the playing area or past the 10 Off space.

TABLE SHUFFLEBOARD

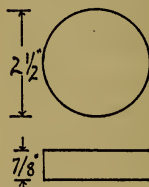
The first Shuffleboard games were on a table, so why not bring them back? For an easy, interesting, engrossing parlor table game Shuffleboard can not be beaten. This



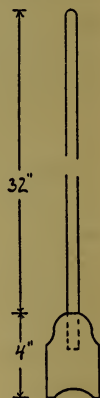
TARGET SHUFFLE



Cue Detail



Disks



Cue

TABLE SHUFFLEBOARD

is not as athletic a game as its bigger brothers but it's still a game that takes precision playing, and it's a game where accuracy rather than muscle wins.

The design I've shown is for use on a regulation Ping Pong or Table Tennis table. If you don't have a table that is large enough you can play the game on the living-room floor or make a court of wall-board that can be used on an ordinary dining-room table or across two bridge tables. The rules are the same as for the two larger games, except, of course, you need not stand on the table to play.

MATERIALS

For the cues get a piece of pine 16" long, 3" wide and $\frac{3}{4}$ " thick, four $\frac{1}{2}$ " by 36" dowels, and a few 2" finishing nails. The disks can all be cut from one piece of hardwood 5" wide, $\frac{3}{4}$ " thick and 16" long. There are two courts for you to choose from. Before going to the lumberyard decide which will best fit your needs. For the simpler one a strip of oilcloth or canvas 2' wide and 10' long and a little black and red paint will finish the list. For the more complicated court you will need a piece of wall-board 2' wide by 9' long, three 9' pieces of 2" by $\frac{3}{4}$ " pine, and a quarter of a pound of 1" nails.

THE CUES AND DISKS

Cut the four cue-heads from the 16" by 3" pine, making them each 4" long. Bore a $\frac{1}{2}$ " hole in the tops $1\frac{1}{2}$ " deep, as shown by the dotted lines in the diagram. Then drive the dowel into the heads. Sandpaper and paint. Two red, two black.

Saw the disks out of the hardwood piece and bore a little depression in each side as described for the regulation set. Sandpaper and paint them. Remember that six should be red and six black. Finish them off with varnish or floor-wax.

THE COURT

If you've chosen wall-board for the court material make a frame for it from the $\frac{3}{4}$ " pine and use any of the wood that you have left over as cross braces to strengthen it. Then nail on the board with the 1" nails. Paint the design on according to the diagram and be as free with the color as you wish. A green board with red scoring areas and $\frac{1}{4}$ " black boundary lines is very handsome.

If you've chosen canvas or oilcloth for the court you will have a nice job for the lady of the house. Bribe her to hem the canvas to a size 2' by 9' with reinforcements and tie strings in the corners. Then size the back of the canvas with white paint to keep the diagram lines from running. If you have decided on oilcloth the sizing will not be necessary. Paint the design as gay and colorful as you please, and when the paint is dry sprinkle the top with a little floor-wax.

PLAYING THE GAME

Now the game is ready to be played. Set the court on the table, tie it down if it is made of canvas, and proceed as described by the rules for the regulation game. Because this game is so small you will have many opportunities to get in the other fellow's way. Be as polite as

possible about it but don't hesitate to use billiard shots to knock his disk off the board. It adds considerable excitement to the game and takes real skill to do it without your disk following.

MINIATURE SHUFFLEBOARD

No, we're not through with Shuffleboard yet. Maybe I should have put this at the beginning and let you work up to the standard game. But I didn't because I've always considered this as a game in itself, not a beginning or an end for the other Shuffleboards, but an entirely different game with its own virtues and vices.

You can carry the entire Miniature Shuffleboard around in your pocket. You'll need six red checkers and six black ones, and one piece of chalk. Draw the diagram on a table, the nearest table to you, choose sides, and go to it. Just snap the checkers with your fingers or a pencil. You'll be surprised at the excitement the little game will cause. If you want to refine on it you can draw the diagram on a sheet and spread it across two bridge tables. This will give you a good surface and a fine range, and it will take a lot of skill to play a good game.

CHAPTER II

TENNIS GAMES

JUST because you haven't got a tennis court made of imported clay is no reason at all why you can't play tennis. You'll have to forego the professional game if the court is missing, but there are many cheaper and more simple games that you can make and play at home. And you will be surprised at how much fun you will all have playing them!

I'm going to describe four of them. The first will be Paddle Tennis because Paddle Tennis is so much like its parent. It's a great game that you can play almost anywhere, out on the lawn, in the driveway, or in the basement. It is very popular in gymnasiums and in summer camps and on playgrounds.

Then there is Ring Tennis. That's the game that has become so popular on shipboard. It's fun to make. It's fast! And you can play it even where Paddle Tennis is not suitable.

The third game was once very popular with the boys at Eton. They still play it there as it has been played for over four hundred years. It is called "Fives" in Eton, but I've also heard it called Hand Tennis, or Beach Tennis, or Sidewalk Tennis, or Parlor Tennis. You can call it whatever you want and play it in all those places it has been named after. In fact you can play it almost any-

where. You really don't have to make any equipment for this game but if you do make the net described later in this chapter it will improve on Fives a great deal.

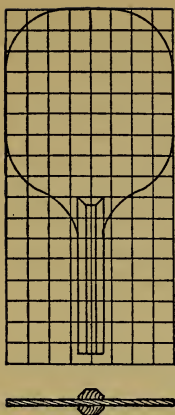
The fourth game isn't Tennis at all. But since it is played with the same equipment as Ring Tennis I'm including it here. For want of a better name I've called it Ring Volley Ball. It is a little volley-ball game in which all the family can join, or all the family friends. It's a fast and exciting game requiring a high quality of team work where the others take only individual skill.

PADDLE TENNIS

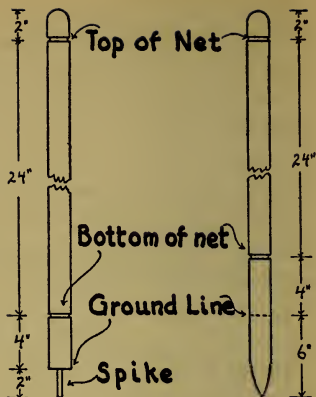
Paddle Tennis is an unusually good game. It is equally popular with children and adults; it does not require an expensive court; and the cost of a complete outfit is little more than one good tennis racket. As an introduction to the standard game it can not be beaten.

MATERIALS

It is probably best to make a set for four, so when you go to the lumber-yard buy your material accordingly. You'll need four pieces of plywood $\frac{3}{8}$ " thick, 17" long and 8" wide. Oregon fir veneer is cheap and will be satisfactory, though basswood will be a little stronger. A 2' piece of $\frac{1}{2}$ " by 6" white pine will complete the wood needed for the paddles. You will need two posts for the outside game. Make them of good wood 3' long and $1\frac{1}{4}$ " square. For stakes get 32" more of the same wood. A small can of varnish, a few wire brads and some good fish-glue will finish this part of the list.

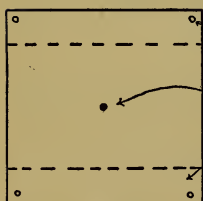


Paddle



Indoor

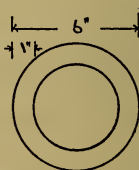
Outdoor



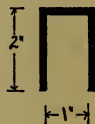
Post Stand

Screw
eye
Post
hole
Batten

Posts



Ring



Staple

TENNIS EQUIPMENT

The materials for the court depend entirely on the manner you choose to mark out the lines. You can use tapes 1" wide, or you can paint the lines, or you can mark the inside court with chalk. Tape is cheap enough in most dry-goods and mail-order houses but unfortunately it comes in short lengths. You will need forty-seven yards, and can sew the pieces together as described later. Making tapes isn't much fun, so if you are not absolutely set on building the entire outfit you might as well buy the tapes at a sporting-goods store. The cost will be little more than for the homemade ones and they will be much more satisfactory.

You will also need staples to tack down the tapes. Make them of #14 fence wire. Twenty-four feet will be enough. Of course, if you are making a set without tapes you will not need the staples. Tapes on inside courts, such as in gymnasiums, can be secured by thumb-tacks. You'll need about four dozen of them.

For the net get about 70' of clothesline or light sash-cord, 400' of chalk-line, fish-line, or other fairly strong cotton twine, and 20' of light canvas 6" wide. Canvas does not generally come in 6" widths so it might be better to get 1½ yards of standard width canvas. That will be about 28" wide and if you cut it into five strips and sew them together it will be satisfactory. The canvas is not really necessary but does finish off the net in a professional manner.

The only additional material that you will need will be for the indoor court. The construction of the posts is slightly different. So get six 8" spikes when you are buy-

ing the rest of the material and you should be all set.

For Paddle Tennis and Fives you will need tennis-balls. Buy them. It's impossible to make them at home. Three will be all that you will have any use for.

THE PADDLE

Cut out the plywood according to the diagram. The squares are each 1" on the side and are there only as guide lines. The plywood goes down the entire length of the handle for strength. Cut them out either with a compass-saw, or better with a large-tooth jigsaw or coping-saw.

Then cut the $\frac{1}{2}$ " by 6" pine into $1\frac{1}{4}$ " strips $7\frac{1}{2}$ " long. Bevel one end of each strip down to $\frac{1}{8}$ ", and the top edge of two of the sides. Fit these pieces onto the plywood handle as shown in the cross-section. Glue them securely and tack them on with a few wire brads. Now the paddles will have a roughly octagonal handle about $1\frac{1}{4}$ " in diameter. Sandpaper it smooth and sand the edges and faces of the paddles.

You can finish off the base of the handles with leather as on a regulation tennis-racket or you can use adhesive tape. This will help you keep a better grip on the paddle when playing the game but it is not absolutely necessary. You might also tape the top of the handles towards the base of the paddle blade. It will strengthen them considerably.

The paddles should not be difficult to make if you follow the diagram and instructions. But remember, above all things, that the glueing job must be carefully

done because it is there that the strength of the finished paddle lies. When the paddles are sanded smooth you can varnish or shellac the faces. But don't varnish the handles. In a fast game a varnished handle will often blister even tough hands.

POSTS AND STAKES

I've shown two kinds of posts, indoor and outdoor. The indoor posts can also be used outside and will be perfectly satisfactory. But if you are going to play the game only outside you will do better to make the posts for the outside. They will be stronger and steadier. The best posts are octagonal, made by shaving off the corners of a square piece of wood. A plane or spokeshave will do the trick. When you've planed down the corners so that they are even all around sandpaper the posts and varnish them with good spar varnish. Or use a good outside paint if you prefer color.

If you make the outdoor posts you will have some of the $1\frac{1}{4}$ " by $1\frac{1}{4}$ " wood left over. Cut this into four equal lengths, sharpen off one end of each piece and round the other. About 2" from the rounded end make a little notch or nick. Use these stakes to steady the posts, two to each post set about 2' apart and $2\frac{1}{2}$ ' away from the posts. Guy the posts to the stakes with heavy clothesline.

The indoor set requires a more complicated post. Cut out the wooden part of the post as shown in the diagram. Then file off the heads of two of the 8" spikes, bore a hole into the bottom of the two posts small enough so you will have to drive the spikes in and large enough so

the spikes will not split the wood. Then drive the pointed end of the spikes into the posts leaving about 2" still sticking out. The other four spikes are to be used as stakes.

To set up these posts you will have to bore holes into the floor large enough to take the spikes. The holes will be quite small and will not mar the floor of most indoor playing spaces. But if there is an objection to boring holes in the floor you will have to make one additional piece of equipment.

The post stand as shown in the diagram is very simple. It is made of 1" pine or other cheap wood and is built 2' square. Screw battens securely across the bottom, bore a hole in the center large enough to take the post spike, and put four heavy screw-eyes in the corners. The screw-eyes are for wire or rope guy-lines to the post. The stand will not be quite heavy enough to hold the net taut, but you can weight it down with a rock or two or some old flat-irons, or run another guy-line from the top of the post to some heavy or stationary object outside the court boundaries.

THE TAPES AND STAPLES

For Paddle Tennis you will need four tapes 39' long, four 18' long, and one 21' long. Bind the ends securely to keep them from unraveling, and, if the tape material is made up of short lengths, sew the connections securely so that they will not pull apart.

If you wish you can make the same tapes do for Deck Tennis and Paddle Badminton. There are two ways to do this: either make the side tapes 40' long instead of 39',

or cut down the outside boundaries of Deck Tennis to fit the Paddle Tennis court. All three courts are the same width, though the Deck Tennis court is a foot longer than the other two. But the game is just as good on the shorter court, and, unless you are an expert, you will probably not be able to tell the difference.

So, if you are going to play all three games, and if you are not set on having the three courts exactly "official," you will find it simpler and less expensive to use the same outside boundaries. But, if you are going to make only one game, or if you are going to have three separate courts, it is wiser to be official and to use the dimensions given in the drawings.

When the tapes are finished make the staples. Cut up the fence wire into 5" pieces. Bend them as shown in the diagram. You can do this job with a pair of heavy pliers, or with a vice and a hammer. Fifty of them will be enough. The suggested 1" width is not absolutely necessary. They should be just wide enough to take the tapes without wrinkling them. If you are going to use the set indoors you won't need staples. Possibly you won't need tapes either if you can paint the lines on the floor. But if you are using tapes indoors fasten them down with heavy thumb-tacks.

THE NET

The net is much easier to make than it sounds. It's a good job for the women of the family to do, and fun even for the men. It must be 18' long and 2' wide. Here's the way to tie it:

Stretch two pieces of cotton rope between two posts 22' apart. You can use chairs or table legs, or almost anything that will hold the ropes taut. The ropes should be parallel and 24" apart. Now from the ball of heavy twine or chalk-line cut 120 pieces each 3' long. These are to be the up-and-down strands of the net. Beginning at about 1' from the post tie the cords to the top rope. Do this by forcing a nail between two strands of the rope so you will have a small hole to push the cord through. Then tie the cord securely around the remaining strands of rope. 2" further on tie another cord, and so on, until you have gone 18'. To make the net stronger tie in two cords at the beginning and end.

Now start with the horizontal cords. You will need 11 of them, each 30' long. Two inches down from the top rope tie the first horizontal to the first vertical cord. Use a square knot. If you don't know how to tie the square knot look up the diagram for Tether Ball where there is a picture and explanation of it. Then, to be sure it will hold, for the strain is uneven, run another half-hitch around the vertical. If you will first tie the horizontal to something solid, the post for instance, you will find it easier to work with. Go the full length of the rope tying the horizontal to each vertical every two inches, always using the square knot. Repeat with each additional horizontal until you have the web completed.

When all the cords are finished tie the verticals to the bottom rope just as you did at the top. Then the net is ready for the final job. Take it off the posts and sew the strip of canvas to the top of the net, making a binding

about 2" wide down the entire length. If you want to do a really good job bind the bottom, too, and both ends. But here use canvas just wide enough to give you about $\frac{3}{4}$ " trim.

There is one easier way to make a net but it is seldom satisfactory. That is to use heavy cheesecloth or other open-web cloth that will let the wind blow through it. Sew it the size you need, with ropes running through the top and bottom to strengthen it and a 2" canvas or cotton band running along the top. This net will be cheaper and easier to make. Unfortunately, though, it will be rather weak, and unless you use unusually good cloth it is likely to become punched full of holes the first time a hard but inaccurate player comes along.

PADDLE TENNIS RULES

When the outfit is finally built, set up the court according to the diagram. The net should be as taut as you can get it without unduly straining the rope. The tapes should be firm and flat, and the playing area should be fairly smooth.

1. Toss for courts. The player who wins the toss has his choice of courts and also is the first "server." He opens the game by standing at the base line to the right of center and striking the ball with his paddle. He must hit the ball in such a way that it goes over the net and strikes the opposite court within the service line and to *his* left of the center line.

2. If the first ball is incorrectly served, if it strikes the net or does not land in the proper part of the court, the

server is allowed another try. If he misses the second serve one point is scored for the opponent, and the server must serve to the opposite court of his opponent.

3. If the service is correctly done the opponent or "receiver" must try to "return" the ball. This is done by allowing the ball to bounce once and then striking it with the paddle so that it goes over the net and lands in the server's court. If the receiver succeeds in returning the ball the server must then try to return it to the receiver. This knocking back and forth is called the "volley." The first player who does not return the ball, or who strikes it so that it falls outside his opponent's court, or who hits it into the net, concedes a point to his opponent.

4. If a ball strikes the net and goes over into the opposite court it is considered a fair ball. There is one exception to this: when the server strikes the ball during the service so that it hits the net and continues over into the receiver's court the service does not count and the server is allowed another ball. This is called a "net ball."

5. This sequence is followed until one of the players wins the game. Then the receiver becomes the server and vice versa until the second game is won. The service alternates game by game until "set" is won.

6. The score is called as follows: 15 for the first point, 30 for the second point, and 40 for the third point won by the same player. The fourth point won by a player gives him "game" if the other player has not scored more than 30. But if the score at any time stands 40-40 it is called "deuce" and either player must gain an ad-

vantage of two points over his opponent before he wins game.

Thus: If the score is 40-40 or deuce and player #1 scores a point, it is called an "advantage" for that player. If the player is the server it is usually abbreviated to "Ad in," and if the player who has the advantage is the receiver it is "Ad out." As soon as a player scores one point more than his advantage he wins the game. But if the score is "ad in" and the receiver scores a point the score goes back to deuce again.

If any player has scored no points in a game his score is called "love." In calling the score the server's score always comes first. Thus: If the score is 30 for the server and 15 for the receiver the score would be 30-15.

You can boil all this down if you want to simplify it. To win a game a player must have made at least one more point than 40 and be two in the lead of his opponent.

7. The player who first wins six games and is two games in the lead of his opponent wins the "set." But if he reaches 6 and the opponent is 5 he must gain an advantage of two before the set is won.

8. Paddle Tennis can also be played as "doubles." The rules are only slightly different. Here there are two on a side. Either one can return any ball but they alternate on the serve. Any points gained by a player add to the total of his team's points.

DECK TENNIS

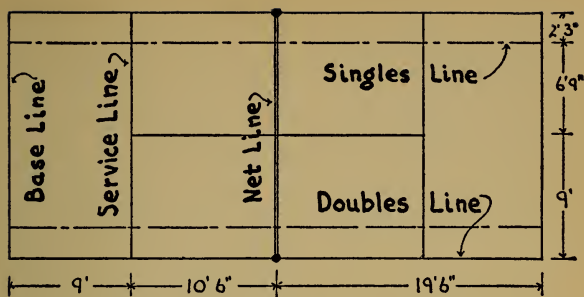
Deck Tennis is one of those old games that struggled along for quite a while before they became very popular. Maybe the name had something to do with it for few people have a deck at their disposal. But you don't need one, for this game can be played anywhere.

The equipment is very simple. You'll need tapes and a net and two posts and a ring. Make the nets and posts and tapes as described under Paddle Tennis. Use the technique—but not the measurements. There is an important difference in the sizes.

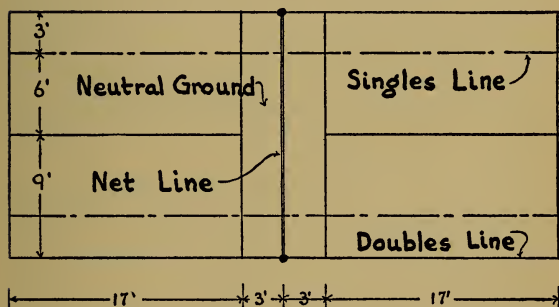
THE EQUIPMENT

The posts must be 5' high, so that when the net is stretched its center is 4' 9" above the floor or playing field. The regulation net is only 18" wide but there is no reason at all why you can't use the Paddle Tennis net described on pages 49 and 50. Make the tapes also as described on page 48 for Paddle Tennis. You will need four 40', four 18' and one 17' tapes.

There are no paddles and balls used in Deck Tennis. In their place is a ring which is tossed from one player to the other. You might as well go back to the old days of the wind-jammers when you make the ring and splice a rope grommet as the sailors did then. You will need 30" of 1" rope. It will make three grommets or rings, but 10 inches will not make one. Grommets are made of single strands of rope and since there are three strands to most ropes you will have two left over for spare rings.



PADDLE TENNIS COURT



DECK TENNIS COURT

Under Ringtoss I've described the making of rope grommets. Splice the ring as shown there but add one detail. When the ring is done dip it into varnish for half a minute, then sew on a jacket of strong cotton or light duck. The varnish will "set" the ring and hold the cover on tightly. You can play Deck Tennis without the cotton jacket, but raw manila rope is hard on the hands and the jacket both strengthens and smooths the ring.

DECK TENNIS RULES

The rules for scoring in Deck Tennis are the same as for Paddle Tennis or the regular game. The only difference to the rules has to do with serving and returning the ring. Add the following to the rules given on page 51.

1. The serve is made by tossing the ring across the net with an underhand throw. The toss must never be overhand and the ring must leave the server's hand while following an upward movement. If the server is at fault the point goes to the receiver.

2. The receiver must catch the ring before it strikes the floor or playing ground. He may return it to the server by throwing it over the net to the server's court.

3. If either player does not catch the ring and return it properly his opponent scores a point. There is one exception to this: A point is scored by a player if his opponent returns the ring in such a way that it falls outside the court lines.

4. The ring must be caught by only one hand. However if it should touch some part of the player's clothing or body it is considered a good catch.

5. If a player in receiving a ring touches it and it falls outside the court it counts one point for the opposite team. This rule holds good whether the player tried to catch the ring or not.

6. There is only one service allowed in Ring or Deck Tennis. However, there is one exception. If the ring touches the net and goes over in service the receiving player has his choice whether to play it or not. If either player calls "Let" before the ring touches the ground another service is permissible.

7. No player is allowed to step into the neutral ground or to toss the ring so that it falls in the neutral area. If he does either of these things a point is given to the opposite side.

8. Deck Tennis can also be played as doubles. In the double game the partners take turns serving but either can return or receive the ring.

RING VOLLEY BALL

Ring Volley Ball is a good game for the entire family. Any even number can play the game but it is better if it is limited to five or six to each team. The equipment is identical to that used for Deck Tennis.

1. Two captains are picked. Each chooses a team. The captains toss a coin for choice of court and first serve.

2. Serve is made as in Ring Tennis from the base line of the court. The return is made by any man on the receiving team. A point is scored for the opposing team if either team serves, receives, or returns the ring improperly. In regulation Volley Ball a different rule obtains

here. You can use either one, providing it is understood at the beginning of the game. In the standard game only the server's side scores and instead of losing a point by a poor play the service is given to the other team.

3. When a point is scored the receiving team serves. If you are playing the old rules this one does not hold true. The service is held by a team until it loses it by rule #2 above.

4. Service is made in sequence by the members of a team. First the captain, then the player to his right, and so on, until the whole team has served. Then the captain is server again.

5. The game is won when either team scores 15 points. Play either a game or a set of two out of three games. After each game change courts.

HAND TENNIS

This is the game that the English schoolboys have played for so many years. But it's hardly confined to them because the equipment and rules are so simple almost everyone has played it. In fact, almost all my friends think they originated the game!

The only equipment is a hard floor, a ball, and a net if you want it. Mark out a court about 8' wide and 20' long. String a net across the center, cutting it into two courts each 8' by 10', and cut each of those courts into two, each 4' by 10'. If you have no net set up a couple of chairs or a box or a fireplace-screen as a substitute.

Play according to the regular tennis rules, serving and returning the ball by striking it with the palm of the

hand. Serving must be underhand but the return can be made any way you wish. You must not catch the ball or hold it in your hand.

Game and set are determined just as in the standard tennis games or according to the rules of the English game of Fives. In that game the points are made in the same manner but a game consists of five points with a lead of two, and set is three games.

The glory of this game is that you need only one ball and a little flat space. I've played it almost everywhere, in the parlor, on the sidewalk, on the beach and even in a log-cabin in the backwoods of Maine. We've always determined the size of the court according to the conditions. The 8' by 20' is driveway size. But you can play it on a 12' by 9' rug and have just as much fun.

CHAPTER III

BADMINTON

BADMINTON is an old English game that slowly drifted over into this country by way of Canada. It took a long time coming, but now that it is here it looks as if it would stay. For Badminton is an unusually interesting game requiring skill and speed, yet not too strenuous for the average person. In some respects it resembles Tennis, but it has several big advantages over that famous old standby: The equipment is much less expensive, and the game can be played either indoors or out.

As far as I know nobody has made a "paddle" game of Badminton as they have of Tennis. That is, they have not done it commercially and there is no standard Paddle Badminton. But you can make very good wooden bats to take the place of the more costly ones, and you can roll yarn balls to substitute for the usual shuttles. And it will still be a good fast game.

If you made any of the tennis games described in the preceding chapter you won't have to make new nets or tapes and the only extra pieces required will be posts and bats and balls. There will be plenty of opportunity for the use of your own ingenuity because there are no standardized rules to keep you in line. Though I took the paddle game directly from the regular one I've found that several changes improved it. The court that I've shown, for ex-

ample, is smaller, made to fit the regular Paddle Tennis court. It's a much handier size for the smaller game.

So after you have played the game for a while you may want to make even more changes, or you may find that a few alterations will improve the game for you. If you do find this to be true don't hesitate to break away from the instructions given below.

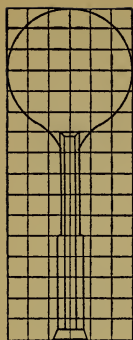
MATERIALS

It will be wise to make the set for four players. Get four pieces of three-ply basswood or other high-grade plywood, $\frac{1}{4}$ " thick, 16" long and 6" wide, and a 24" piece of $\frac{1}{2}$ " by 6" white pine for the paddles. In addition to this you will need a little glue and a few small wire brads. A two-ounce ball of ordinary woolen yarn, any bright color, will be enough for three Badminton balls.

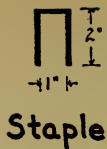
Go back to page 45 to check over the material needed for the net and tapes and posts. With the exception of the length of the posts the material will be just the same. These should be 63" long for the indoor set, and 69" long for the outdoor. You should have two of them, each 2" in diameter.

MAKING THE GAME

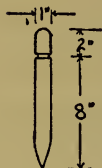
Here again I'll refer you back to Paddle Tennis for instructions on making the equipment. The paddle for Badminton is slightly different in design but the same in construction. You can make it easily by following the suggestions on page 46 and by studying the diagram. The posts and stakes are described on page 47, the net, tapes,



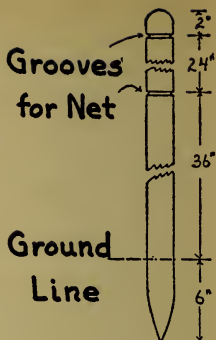
Paddle



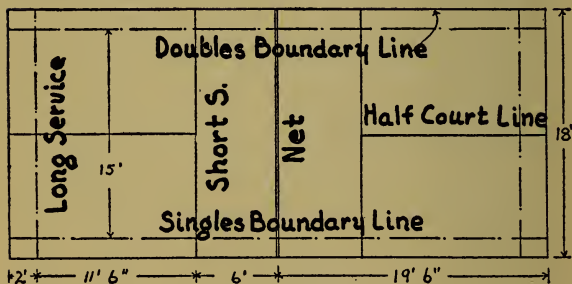
Staple



Stake



Post



Court Layout

BADMINTON

and staples are on page 48. The only differences are in the measurements, and they are all given on the drawing.

But when you come to making the yarn ball you will have something entirely new. If you were brought up in the country you probably made many yarn balls and know just how it's done. But if you were born in the city you should still have little trouble. Pull the free end out of the center of the big ball of yarn and wind it around two of your fingers for about ten turns. Then take it off your fingers and make about ten more turns around the ten you have already made. From then on just continue winding, constantly changing the direction of the yarn, until the ball is as nearly round as you can get it.

The first windings should be fairly easy, to give the ball a soft heart, but as you get further along wind it more tightly to strengthen it. When the ball is about $1\frac{3}{4}$ " in diameter stop winding up the yarn. Cut off the yarn about 24" from the new-made ball and thread a darning needle on it's end.

Now sew the extra yarn back into the ball in such a way that the stitches keep the windings from coming loose. When the spare yarn is used up the ball will be finished. Make two more balls from the yarn that you have left over.

PLAYING THE GAME

When the outfit is all built set up the court according to the diagram. The top of the net should be 5' 1" from the floor on the ends and 5' high in the center. The posts should be set firmly in the ground or guyed solidly. Let

the first game be "singles" or two-handed. Then when you have the knack of it ask in two more players for a "doubles."

1. Toss for courts and the choice of serve. The player who wins can either pick his court or decide whether he serves first or second. The player who loses has the choice of what is left. In the second and all succeeding games the player who wins must begin the serve.

2. The winner of the serve opens the game by serving from the right-hand court to his opponent's right-hand court. After the first serve the server serves to the right-hand half-court only when his score is 0 or an even number. When his score is an odd number he must serve to the left half-court.

3. When a fault (see below) is made by the server it puts him out and the receiver becomes the server.

4. When a fault is made by the receiver it counts as an "ace" for the server.

5. It is a fault if:

a. The service is overhand. That is, if the ball at the instant of being struck is higher than the server's waist.

b. The ball falls into the wrong half-court, or short of the short service line or beyond the long service line, or outside the boundaries of the court.

c. At the moment of service, the server is not standing within the boundaries of the proper half-court, or if the player taking the serve is not within his half-court.

d. The ball, when in play, falls outside the court, or passes through or under the net, or fails to pass the net.

e. The ball, when in play, is struck before it passes to the striker's side of the net.

f. The ball is hit twice in succession by the same player.

g. The ball strikes any part of a person or his paddle or clothing and falls inside the boundaries of the court.

6. If the ball touches the net in service, but the serve is otherwise good, the server may serve over again. However, if neither he nor his opponent calls "let" it is considered a good serve.

7. It is also a "let" if a player serves out of turn or from the wrong court and the mistake is called before the next serve.

8. In the four-handed or doubles game the rules are essentially as given above, with the following differences:

a. Only the player served to can receive a served ball. If the other player of a team receives the ball it is a fault.

b. When a fault is made by the "in" side the server's hand is out and the serve is given to the other team. The side beginning the game has only one hand in the first inning. But in all succeeding innings each partner has a hand, serving consecutively.

c. The server changes half-courts each time his side makes an ace. He continues doing this until he loses the serve.

9. The game generally consists of 15 or 21 aces. In a game of 15 aces, if the score be "13 all" the player or team to reach 13 first can "set" the game to 5, and when the score is "14 all" the player or team to reach 14 first can set the game to 3. After a game has been set the score is called "love all" and the team or player who first scores

5 or 3 aces wins the game. In a game of 21 aces players can set the game when the score reaches 19 or 20 all.

10. A rubber is the best two out of three games.

The above are all the important rules for Paddle Badminton. But if you would like to have the standard rules for the big game you can find them in Spalding's "Lawn Sports."

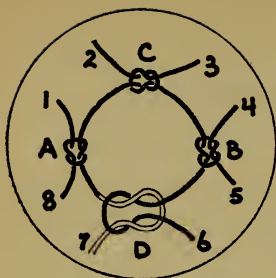
CHAPTER IV

TETHER BALL

THIS is one of the most surprising games I ever came across. For some reason I could never get interested in Tether Ball for it looked too much like a game designed for three-year-olds. But then one day we made an outfit—and discovered one of the fastest two-handed games we had ever played. But even those first games didn't hold a candle to those that came later when we learned the technique. We found that we had to be on our toes every second of the game, that we had to use skill and speed even against a slow player, but best of all, or maybe worst, we found that everyone wanted to play it at once!

It all sounds too good to be true but I haven't yet exhausted all the virtues of Tether Ball. It is easy to make, remarkably cheap, and takes up very little room. A clear space twenty feet square will make the court. A tennis-ball, two rackets, a bit of cord and a pole constitute the equipment. What could be more simple?

Whether you are a tennis enthusiast or not you will probably like the game. We liked it so much we even made a miniature outfit to play in the parlor with Table Tennis paddles. And even that game was a surprise to us. We made it first as a joke. But it, too, turned out fast and interesting like its father. So here I'll describe both of them for you. The regular game, of course, comes first.

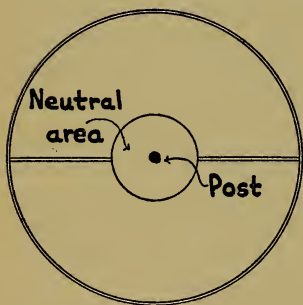


1st and 2nd Stages

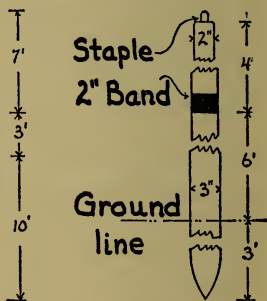


3d Stage

Tying the Ball



Court Plan



Post

TETHER BALL

THE POST

The post or pole will be no trouble at all. If you live in the country you can probably go to the woods and cut a pole that will do. That's what we did. But if you live in the city or town you can make a pole that will be handsomer and more expensive, but hardly any better.

Get a tree, or a pole, about 13' long and measuring about 3" in diameter at the base. If you are using a tree be careful to pick one that's perfectly straight. Then peel off the bark and paint a black line 2" wide around it 4' from the top or smaller end. If you are going to make the post from a piece of lumber get some straight-grained wood 3" by 3" and 13' long. Cut it down with a draw-knife and plane so that it measures 3" square at the base and about 2" square at the top. Then plane down the corners to make it octagonal. Paint the 2" black circle as described above, and the pole is ready.

THE BALL

You can't make the ball but you can buy one. A plain tennis-ball is the best. You'll have to make a net for it because it must be tethered to the top of the pole with a piece of cord. Plain chalk-line or heavy fish-line is the best cord to use. You'll need about 10' of it altogether. Cut the 10' piece of cord into four even lengths, then look at the diagram and go to it.

Tie two lengths of line together in the middle, using the square knot shown at "D." Then tie the other two pieces in the same manner. Now you will have four ends.

Tie these together as shown, making a rough square about 1" on the side. Now the job will look like the diagram under "2nd Stage." Pull all knots tight. If any come loose they were tied improperly. Tie them over again, following "D."

Next make four little triangles as shown in "3d Stage." Tie 1 and 2 together, 3 and 4, 5 and 6, 7 and 8. Now it will look something like "3d Stage." You have made one square, now, and four triangles. The next thing to do is to make four diamonds. Do this by tying 1 to 4, 3 to 6, 5 to 8, and 7 to 2. The net will begin to look like a basket.

If you have gone so far without mishap the rest is rather easy. Set the ball into the net and tie four more diamonds. Pull them very tight, so that the ball is held securely, and on top of that tie four more diamonds. That will be enough. Divide the eight ends into two parts, four strands in each, and tie a good strong square knot against the ball. Throw in one extra half-hitch for luck and tie the ends together to form a loop. The job is done!

SETTING UP THE GAME

Before putting up the post tie the ball to it. Use high-grade mason's line or very strong fish-line. Chalk-line will not be strong enough and most soft-woven cord will fray quickly. The ideal cord is the so-called cod line. It is tough and strong and light. Tie the cord to a staple or heavy screw-eye on the top of the post. Then 8' away tie the ball securely to the other end of the cord. When the post is up the ball should hang free 2' from the ground.

Set the post firmly in the ground. The black circle

should be just 6' from the surface. The post should be secure and solid and should not vibrate when the game is being played. If you bury 3' of it it should hold anything.

Now mark the court as shown in the diagram. The inner circle is taboo ground. The outer circle is not really necessary but you can put it in if you want to. Be sure to mark the cross line very plainly. In the excitement of the game it's easy for a player to forget where he belongs.

There is only one additional bit of equipment. You'll need two tennis-rackets. But if you have none you can make some quite satisfactory paddles as described on page 46. The game will be a bit slower if you use paddles, but it will still be about as fast a game as you have ever played.

THE RULES

The object of the game is to wrap the tether string around the pole above the black line. One player tries to wrap it in one direction and his opponent tries the other direction. The first one to do so wins one point.

1. Players toss for first serve. The winner of the serve has his choice of court; the loser can choose the direction of play.

2. Service is made by the player standing in the center of the court and striking the ball with his racket. He may strike it any way he wishes and in any direction. But if he winds the string in the opposite direction from the one agreed on at the opening of the game the point goes to the opponent.

3. The receiver must try to keep the server from wind-

ing the string around the pole and must try to wind it in his own direction. He may hit the ball any way he wishes, but no player can strike the ball more than once before it has gone into the opposite court.

4. Each player must remain within his own court. This means that he must also keep his arm and racket inside his own court. If he fails to do this, or if he steps into the neutral area it constitutes a foul.

5. A foul is also made whenever the string wraps around a player's racket or arm or other part of his body, or when a player or his racket touches the post.

6. A free hit is allowed the opponent for every foul committed. When a free hit is given the ball must not be intercepted or struck by the player committing the foul until the ball has passed completely through his court once.

7. Game or point is made when the string is wound completely around the pole *above* the black line.

8. After each game or point the service is given to the other player. He can choose the direction in which to wind the ball for that game.

9. A set is won by the player first reaching six games or points with a two game lead.

MINIATURE TETHER BALL

Miniature Tether Ball is on the order of Table Tennis and such games, but considerably faster. You can play it any place where there is a free area of about 12' square, or even in a smaller area if you make a smaller outfit. The game is made just as the larger game but all is on a

smaller scale. The measurements given here are entirely arbitrary and were decided upon to meet our own conditions. But I believe that you will find them satisfactory.

THE EQUIPMENT

The pole we used was an old sailing-canoe spar about 8' long and 1½" in diameter. It came to about 15" from the ceiling of the playroom. Any fairly strong pole of about the same measurements will do for your outfit. Paint the black band around it about 26" from the top. Fit it into a stand similar to the one described for indoor Paddle Tennis on page 48. Weight it down with a few rocks, some old flat-irons, or a stack of magazines.

A sponge-rubber ball about 1¼" in diameter, tied in the same manner as the larger outfit but with slightly lighter line, will do. Suspend it from the pole with a 6' line. The only additional equipment that you will need is two Table Tennis paddles. If you don't happen to have any in the house you can make some as described on page 149.

THE GAME

The court, of course, is smaller than for the bigger game, but the neutral area should be just as large. Mark a 6' circle on the floor with chalk or string and draw the division line as for the big game. Follow the rules given on page 71. It might be wise to remove all breakables from the room where you are going to play Miniature Tether Ball. You can never tell what is going to happen in the heat of the game.

CHAPTER V

TENPINS AND SKITTLES

THE regulation bowling games are all great fun, but unfortunately a standard alley is entirely too expensive for the average person or camp or playground. But this is no reason at all why you should have to forego the joys of bowling. Tenpins and Skittles are remarkably versatile adaptations of bowling that can be easily built and can be played under many different playing conditions. They have a portability that no bowling alley ever had and the whole outfit for both games will cost you less than one high-grade bowling ball.

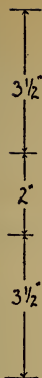
I've put Tenpins and Skittles together here because practically the same equipment is used for both games. In Tenpins balls are rolled down a flat surface at the pins. In Skittles disks are used instead of balls, and are either thrown or slid at the pins. That is the only difference. You can play Tenpins only when you have a smooth floor to use as the alley. But you can play Skittles practically anywhere. Here I'll give you large-sized versions of each game to play in your cellar or on your lawn, and little games to play indoors.

MATERIALS

Get a square piece of maple or some other hardwood measuring $2\frac{1}{4}$ " by $2\frac{1}{4}$ " by 8' long. You can use pine if



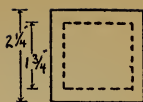
A



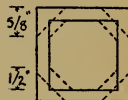
B



C



a

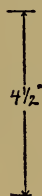
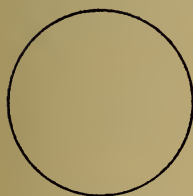


b

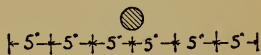


c

TENPINS



SKITTLES DISK



SET-UP OF PINS

you wish, but the pins made of it will be too soft and will wear down quickly. However, pine does have some advantages; it is easier to work and costs less than maple. Whatever wood you buy be sure that it measures as above. Sometimes the mill will cut the wood to order and then plane it down too small. So be sure you know what you are getting. At the same time buy a piece of maple measuring 15" by 5" by $1\frac{1}{4}$ " thick. This *must* be hardwood. Softwood will not do.

THE PINS

Cut the long piece of wood into 9" pieces. Be sure that your ends are absolutely square, because these ten pieces of wood are to be made into pins and must not be wobbly. Then look at "A" in the diagram and mark off the blocks as shown by the dotted lines. Mark the top and bottom of each block as shown in "a," and then saw off the shaded portions. You will now have something that roughly resembles "B." It will be $2\frac{1}{4}$ " square amidships and will taper down to $1\frac{3}{4}$ " square at the top and bottom. There are no fancy knobs and things on these pins. They are what is known as "candle pins."

Now mark the rough pins as shown in "B." Those dotted lines are $\frac{1}{4}$ " in from the top and bottom and $\frac{3}{8}$ " in at a point $3\frac{1}{2}$ " from each end. Mark the top and bottom as shown by the dotted lines in "b," and plane off the corners. You will have an octagonal affair now and your pin will be about half finished.

If you have a spokeshave, clamp the pin in the vise and plane off the corners of the octagon. If you have only

a plane to work with, turn the iron down until it cuts the merest shaving and plane off the corners of the octagon until you have a sexadecimal pin. That sounds good enough to end on, but it isn't. Plane off the corners that are left, sixteen of them, and I don't know what you'd call it but it will be pretty near round. If you are using a spokeshave you might try taking off some more corners. But if you have only a plane you had better go on with the next step from here.

Sandpaper the pins carefully, using #1½ paper, rotating the pin all the time until it is as nearly round as you can hope to get it. Then smooth it down with #1½ paper, polish it up with #1/0. Your pin will look something like "C" now and the top view will be something like "c." You will need ten pins altogether. Varnish them if you wish and set them up on their ends to dry.

SKITTLES DISKS

When the pins are all made and waiting to dry hunt up the other piece of wood and mark three circles on it measuring 4½" in diameter. These will eventually be disks for the Skittles. Cut them out with a compass-saw, or cut them square and octagonal, etc., until they are nearly round. Smooth them off with sandpaper, rounding the edges slightly, and stain them. Now the game is ready to play.

RULES FOR TENPINS

Set up an alley in the place where you intend playing the game. This alley need not be at all complicated and can consist only of a free space to roll the balls in. But it

will be better if you can have some sort of a back-stop. An old mattress or a gunny-sack full of leaves or hay will be satisfactory. Directly in front of the back-stop, about 3' away, chalk the diagram for the pins. And directly in front of the diagram, about 40' down the alley-way or cleared space, draw a straight line parallel to the back row of pins. This distance is entirely arbitrary and you can lengthen or shorten it to fit your own conditions. The floor should be fairly smooth. Most playgrounds, gymnasiums, meeting-halls and floored cellars will be satisfactory.

You will need three balls in addition to the equipment described above. Ordinary wooden croquet balls will be good enough. Composition croquet or roque balls will be better.

1. The pins are set up as in the diagram. The floor under the pins must be absolutely smooth so that the pins will stand firmly. The apex of the triangle points away from the back-stop towards the player.

2. Toss a coin or draw straws for the order of play. Any number of people can participate in a game of Tenpins, but five or less will usually be found to be the best number. Players bowl in turn. Each player is allowed three balls and after each player's turn the pins are set up again for the next player.

3. Players must remain behind the line when bowling. They must roll the ball, not throw or pitch it, at the pins.

4. Each turn of three balls is called a "Frame." Ten frames make a "String." Usually three strings is considered "Game."

5. Scoring is done as follows: If a player strikes no pins with his three balls he makes no score. If he uses all three balls he is credited with one point for each pin knocked over.

But, if a player uses only two balls and knocks over all the pins he is credited with a "Spare." He is given 10 points for that frame and in addition any points that he makes with the first ball on the next frame. These additional points are *not* deducted from the score for the following frame. In other words, the score for the first ball in a frame following a spare is counted twice. This is done instead of setting up the pins again in the same frame and allowing the player his third or unused ball.

If a player knocks over all pins with his first ball it is called a "Strike." The score for the first two balls in the following frame is added to the score of the frame in which the strike was made. That is: A strike doubles the score for the first two balls in the following frame.

6. If at any time a player steps over the bowling line or commits any other foul the score for the remainder of the frame does not count.

7. Game is won by the person having the highest score at the end of three strings. Or, when only two are playing, game can be won by the person winning two out of three strings.

RULES FOR SKITTLES

Skittles is a really remarkable game that unaccountably has not been very popular. It has one big advantage over Tenpins: It can be played whether the floor is smooth

or not. There are two ways to play Skittles. One is by throwing the disks; the second by sliding them. In throwing the disk an underhand, flat toss, like the throwing of a horseshoe, will generally be the most satisfactory. Overhand throws are generally not allowed.

If you are going to play Skittles by sliding the disk towards the pins you can do it in one of two ways. Either throw the disks with the hand so that they strike the floor at a point not more than 10' from the throwing line, or push them from the throwing line with Shuffleboard cues. Directions for making these cues are given on page 28.

Set the pins up as for Tenpins. The general rules and methods of scoring are the same for both games. In Skittles, as in Tenpins, the distance given is entirely arbitrary. You may find that you are making a lot of spares and strikes, or you may find that you never hit the pins at all. Change the distance until you get the one that seems best for you.

Some day you may want to play a really strenuous game of Skittles. If you do you might set up the pins outdoors, putting them twice as far apart as in the diagram and using a range of 75'. Make the disks about 8" in diameter and an inch thick, and throwing them discus-wise, try to hit the pins—just try! You may still be at it when the winter comes, and if you are you need not stow the game away for the next fair weather. You can set up the pins on the ice and slide the disks at them, or you may shoot at them with a hockey puck. It makes a grand ice sport!

MINIATURE SETS

Just cut these measurements in two for the small sets. You can play miniature Skittles or Tenpins on a table or on the floor of the living-room. If you have a Table Tennis table it will be just the right size for table Tenpins or Skittles. Wax the little disks so they will slide more easily. If you have made a Table Shuffleboard as described on page 37 you can paint the Tenpin design on the opposite side of the Shuffleboard court and make two games from one. The small Shuffleboard cues are just the thing for sliding the Skittles disks. There are almost unlimited possibilities that can be worked out, and many will occur to you spontaneously after you have played the game for a while.

To play Tenpins on the living-room carpet you will need some small balls. Golf balls are just the right size. Large glass aggies or small croquet balls like those sold in the ten-cent stores are also good. Judge the distance by the room available and by your skill at the game. Use the rules given on page 79.

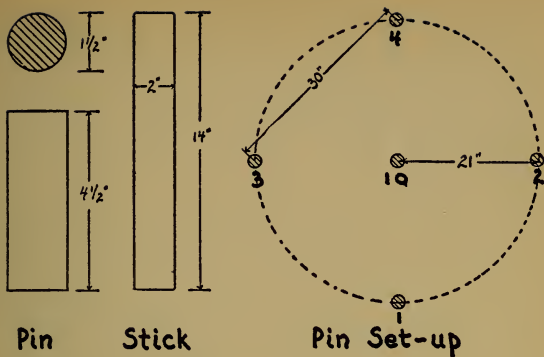
CHAPTER VI

SKIDDLES

SKIDDLES is an interesting little game that has turned up recently on a lot of playgrounds and in many camps. Nobody seems to know just where it came from. Some say it originated in Ireland, some say that it is an adaption of the older game of Skittles. But it doesn't really matter whether it started by Irishmen throwing shillalahs at tomato soup cans, or boys throwing sticks at bottles. What is important is that it's a very good game, and very simple.

In fact it is the easiest game to make in this entire book. Just get a $22\frac{1}{2}$ " piece of pole $1\frac{1}{2}$ " in diameter, and three pieces 2" in diameter and 14" long. Saw the longer pole up into $4\frac{1}{2}$ " sections and sand the edges slightly round. Sand the 14" sticks a little more so the ends are actually rounded. That's all unless you want to do a fancy job. If you want a really handsome outfit you can paint the little sticks each a different color, say: red, green, blue, yellow, and white. Or you can number them 1, 2, 3, 4, and 10. These are just refinements and are not really necessary in this simplest of all games.

Set up four pins at the corners of a 30" square and put the fifth pin in the center. The pin nearest you counts 1, the one to the right counts 2, the one to the left is 3, and the one to the rear counts 4. The center pin is 10. If you



SKIDDLES

have numbered the pins set them in the proper positions. If you have colored them give each color a number.

Now stand about 60' away in a direct line running between the 4 and 1 and try to throw the 14" sticks, one at a time, at the pins to knock them over. You are allowed three throws; game is 100 points. But here's the rub: If you go over the 100 you have to start all over again. It's like cricket and lasts forever!

Probably you'd prefer playing Skiddles in such a way that there is a possibility of winning the game, or at least ending it! If that is so you'll have to change the real rules a little. You can either set the game at 100 and the first player there wins, or you can set it at 100 and not count any throws that put the score above it. Or you can even make a third change: play ten frames or innings and the highest score wins.

Skiddles is also a fine ice sport. You can play it either with a hockey puck and hockey stick, or you can use the regular throwing stick and slide it across the ice. Like most simple games Skiddles has infinite possibilities. Don't hesitate to make up as many new games out of it as you can devise.

CHAPTER VII

DISK CROQUET

CROQUET is one of those good old games that seem to have been neglected lately. Maybe it fell out of use because it was too easy-going for this high-speed age—or more probably because it requires a fairly large lawn and less people have suitable playing grounds than they used to have when croquet was in its heyday. But with a little ingenuity you can make a game that can be played anywhere, in the driveway or the cellar, in the living-room even, and with slight modifications, on the dining-room table.

Sounds complicated. But it's really quite simple to build, though it is a versatile game and takes a versatile player. You will need all the old technique of croquet, and new skills for the new game. Making the set is not at all difficult, and many of the pieces can be used in other games only remotely related to the old croquet. There are two games here: regular Disk Croquet; and a miniature set to play on a table.

MATERIALS

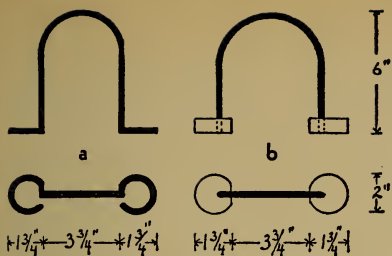
If you are going to make a set for six players and want to do it properly you will need the following materials. But before you go down to the lumber-yard read all about Disk Croquet because you may have some material

in the cellar that you can use as a substitute and it may be just as good for your first outfit. Then, if you want to get the best lumber and make the best set, go ahead. It will be money and time well spent.

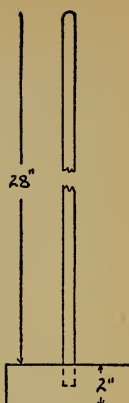
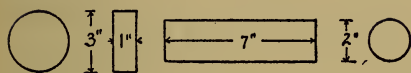
Get about 5' of maple or birch or other fairly tough wood measuring about $2\frac{1}{4}$ " by $2\frac{1}{4}$ ". This is for the mallets and you will have to round it off. But, if you'd rather not go to the trouble you can buy a round pole 5' long and 2" in diameter. You can take your choice of materials for the mallet handles. Three 5' pieces of $\frac{3}{4}$ " dowel will do if you are not too ambitious. But if you want to round off your own handles get some good straight-grained tough wood 30" long, 7" wide and 1" thick. Or, if you have a lot of old brooms down in the cellar their handles can hardly be improved on.

You will need another piece of hardwood for the disks. A piece of maple about 6" wide, 24" long and 1" thick when planed will be best for this purpose. About eight feet of heavy fence wire, or the kind of wire they use for barrel-hoops, will fill out your materials. If you want to make the best of all sets buy a 6" by 1' piece of lead "flashing." This is the thin metal that's used around chimneys to keep the rain from leaking in. And, though Disk Croquet is a fine game for a rainy day the flashing is to be used to weight down the arches or wickets, not to keep the rain out.

Very probably you will have enough paint for this outfit. But if all your paint cans are empty get some ten-cent-store-size cans of red, black, blue, green, yellow and white. You can use these paints for many more games.



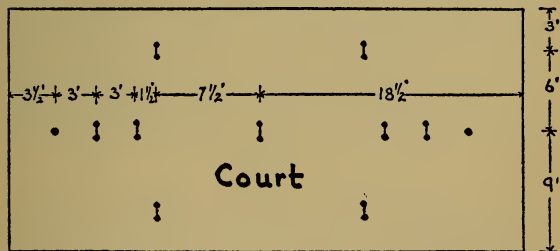
Wickets



Disk

Stake

Mallet



DISK CROQUET

THE MALLET

If you are going to do all the work yourself on the mallets begin by taking your $2\frac{1}{4}$ " by $2\frac{1}{4}$ " piece of maple and rounding it off. Mark straight lines on each side of the wood about $\frac{3}{8}$ " from the edges. Then plane down the corners to the lines, making a roughly octagonal stick. Turn down the plane iron until it cuts the slightest shaving and plane off the eight corners. If you have done a neat job you can stop there, but if you prefer you can plane off the sixteen corners and sandpaper the thirty-two-sided stick. Use #1½ paper first, finish off with #½ or, if you want the best of all jobs, polish up with #1/0.

Now you will have a round stick 5' long and 2" in diameter. Put it in the mitre-box and cut off six 6" sections. These are to be the mallet heads. Also cut off two 7" pieces to be used as stakes for the indoor game. The mallet heads must have true faces. That's why I suggested the mitre-box. But if you have no mitre-box in your outfit you can do a reasonably good job by setting the round pole on a flat surface, and, holding your try-square against the surface of the pole, marking the lines with a knife blade.

Sand the faces carefully, slightly rounding the corners. Sand the posts, too, but leave one face of each as square as possible. When you are through with this your posts will be all finished but the painting, and the mallet heads will be ready for the handle holes. But don't bore the holes until the handles are ready. You can never tell how accurately you'll make the handles, and you want them to fit snugly.

If you have plenty of old broom handles around use them instead of making new handles for the mallets. They will be tough and durable, and about the right size. But if you can't dig up six ready-mades you will have to make some yourself. You have two choices here. Either cut $\frac{3}{4}$ " dowel to fit and round off one end, or make the handles from the piece of 7" by 1" wood. Saw this up into strips 1" wide and 30" long. Then round them up with the plane as described above for the mallet heads. If you have a spokeshave it will be easier to use than a plane and will give you a better job. Round off one end of each stick and sandpaper them all carefully.

Now comes the assembly. Carefully bore a hole $1\frac{1}{2}$ " deep in the middle of each mallet head as shown by the dotted lines in the diagram. Be sure that the hole is slightly smaller than the handle so that when you drive the handle in it will hold snugly. Paint a bit of glue over the flat end of each handle and drive them into the holes in the mallet heads. Do this by forcing them in as far as you can with your hands, then hold onto the handle with the head hanging down, and strike the handle sharply with a block of wood or a carpenter's mallet.

You will probably want to paint the mallets in the old manner. Use a different color for each one. Paint a $\frac{1}{2}$ " band around each mallet head about 1" from the face. When the paint has dried varnish the head and handle. Paint the stakes, too. You don't have to candy-stripe them as the regular ones are, but it would make them very handsome.

THE ARCHES

I've given you two choices of arches. Personally I prefer the all-wire one, but if you are a better carpenter than you are a wire-twister you will probably prefer (b), the wire and wood arch. If you are going to make the all-wire arch cut your wire into pieces about 28" long. Bend them as shown, making them 6" high with a spread of 4". You can make the circular "feet" by clamping the wire in a vise and then bending it with a heavy pair of pliers.

If you'd rather have the wooden stands they are not difficult to make. Cut the wire into 16" lengths and bend to form arches 6" high and 5" wide. Then cut out the feet from the hardwood. Bore a hole through each foot $\frac{1}{2}$ " from the inside edge and just large enough to take the wire very tightly. Put them together as shown in (b). You can improve considerably on these by cutting the lead flashing into pieces the same size as the feet and tacking them on. The thin lead will give the arches just the extra ballast that they need. You will want nine arches altogether. But when you are making them it will do no harm to make a tenth to use if you happen to break or lose one of the others.

THE DISKS

The disks are easy to make. Just take the rest of your maple board and cut them out with a compass-saw. 3" in diameter and 1" thick is the best size. If you make them any thinner they will be a bit too light for accurate playing. When you've smoothed them off with sandpaper

you can paint them in colors corresponding to the colors you used on the mallets. Unfortunately use will rapidly wear off enamel or paint and the disks will soon look old and battered. If you want them always to look nice bore a 1" hole $\frac{1}{8}$ " deep in the center, top and bottom of each disk. Then paint only the slight depression and the color will not wear off. There is another good way to make the disks. Bore the hole $\frac{1}{4}$ " deep and tack in a round piece of the lead flashing. That will give the disks a bit of added weight and make them easier to play with. When the disks are all finished polish them up with floor-wax. They will slide better then and will always look neat.

RULES FOR PLAYING

The court I've drawn is just about half the size of a regulation croquet court and is for use where you have a free space that size. You will need a clear floor 35 by 18 feet. Any gymnasium is large enough and most cellar playrooms or barns have sufficient space. But if your room is smaller you can cut down the measurements slightly to fit.

You can play either partners or free-lance. If you want to play partners decide your teams by playing for the beginning stake from the center of the court. First and third nearest the stake team up against second and fourth. Order of play is in the same order. Thus: the nearest to the stake plays first, the second nearest follows, etc.

1. Direction of play is as follows: Through the first two arches, to the right wing arch, down to the center, to the right lower wing, down to the two lower center

arches, hit the lower stake, return through the lower center arches, up to the lower left wing, down to center, up to upper left wing, down to upper center, and the home stake.

2. The first player starts the game by placing his disk between the home stake and the first arch about 1' from the arch. For each arch, in the proper direction of play, through which the player drives his disk he is allowed an additional stroke. Thus: if he gets through the first two arches on the first stroke he is allowed two strokes for the third arch, etc. His inning ends when he fails to score. Then the player second in order comes up and plays until his inning ends.

3. The stroke must be a clear, sharp hit. Pushing or shoving the disk is not allowed. The player's inning ends immediately if he does this, or if he strikes the disk twice.

4. If a disk is knocked out of bounds it must be brought back to a point 6" within the boundary line and at right angles to it.

5. If a player strikes another disk with his in the course of play he may either "croquet" the other disk or take a free stroke. But if the player's disk is in contact with the other disk he must croquet it. The hit disk is dead and cannot be struck again until the player's disk has passed through the next arch in the line of play.

6. To croquet a disk a player places his disk in contact with the hit disk and, holding his disk firmly with his foot, strikes it with his mallet. When properly done this

will drive the hit disk away but will not move the player's own disk. The player is then free to take another stroke. However, if his disk slips out from under his foot his inning ends.

7. When one of the players finishes the line of play he can either hit the final stake and complete his share of the game, or he can pass through the last arch, not hit the stake, and become a "Rover." A rover has no special rights but sometimes he can become a big nuisance to his opponents and a help to his partner. He plays in turn according to the regular rules. But if he hits another disk he can croquet it and place it in a bad position. Or he can help his partner by hitting his disk and croqueting it into a good position.

8. Game is ended when two partners have passed through all the arches in the proper order and have hit the final stake. If you want to count in points instead of games won take one point for each arch and stake. That will give the winning team 16 points for each ball and the losing team 16 points less the number of stakes and arches each ball has not passed through.

There are more rules for croquet than these simple ones that I've given you, but they seldom come into use. However, if you want to play professional croquet there is no better guide than Spalding's "Lawn Sports," published in New York City. It gives the standard rules, American and British, for the standard game of croquet. And most of these rules can be transferred directly to the disk game.

MINIATURE CROQUET

Miniature or Table Croquet has never been a satisfactory game because the small balls were always rolling off the table or were too light for skillful playing. But if disks are used instead of balls it becomes a fascinating game requiring considerable skill and accuracy. It's a good parlor game, not only for children but for adults as well. It's rather a quiet game, but it builds much enthusiasm.

MATERIALS

Make your miniature set exactly as the larger one. But make it smaller, of course. The disks are just half size, though they will be better if made $\frac{3}{4}$ " thick. You will need a 5" piece of maple $\frac{3}{4}$ " thick and 3" wide for them. The mallets should be $1\frac{1}{2}$ " by 3" instead of 2" by 6". All six heads can be cut from one piece of wood $1\frac{1}{2}$ " in diameter by 18" long. Make the six handles from $\frac{1}{2}$ " dowel. Between 15" and 18" is long enough. All nine arches can be made of 12' of fence wire, and a 6" square of lead flashing.

BUILDING THE SET

Follow the instructions given on page 88, changing the measurements, of course. The mallets are $1\frac{1}{2}$ " by 3" with 15" by $\frac{1}{2}$ " handles. The disks are $1\frac{1}{2}$ " by $\frac{3}{4}$ ", and the arches are $2\frac{1}{4}$ " by 3" high. You can use cues as described under Table Shuffleboard instead of the small mallets if you like. Paint them with stripes to match the disks.

PLAYING THE GAME

You can set up the court on the dining-room table, on a Table Tennis table, or on a hardwood floor. Keep the same proportions as shown for the larger set and adjust the dimensions to the available space.

The rules for playing are the same as for the larger game except for one or two exceptions. If you are using cues or pushers you had better push the disk instead of striking it. So just reverse that rule and make striking illegal. And if you hit a disk and must croquet it you'll run into difficulties if you try to hold down your disk with your foot! Just hold it down with your free hand and strike the disk sharply with your cue or mallet.

CHAPTER VIII

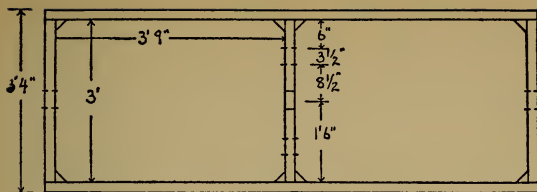
BOX HOCKEY

It is hard to believe that you can confine the good old game of hockey to a box. But when you do crate it up you will find that you have one of the most extraordinary games you have ever seen. It's hockey concentrated, not hockey shackled. It takes more stamina than any other two-handed game I've ever played; it takes skill, and it's truly exciting because your chances for winning change from one moment to the next. From the second you start to the final stroke you will never know who is going to win. It's packed with suspense for player and spectator alike and never palls.

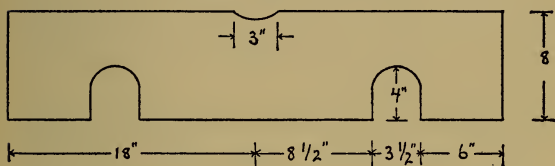
Like most of the really good games Box Hockey is very simple. The equipment is easy to make and the rules are easy to learn. But like all simple games the technique of playing comes only with practice. Every new game brings new ideas of play, and every new trick adds new interest. You can play the regulation game either indoors or out. It takes little space. You can even make a smaller version for the living-room if you wish. I'll describe both of them for you.

MATERIALS

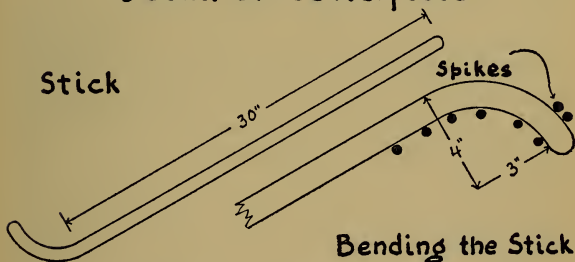
For the regulation game you'll need some heavy lumber. Get three pieces of 2" by 8" hemlock or other fairly cheap wood 9' long, and one piece of 2" by 4" measuring



Playing Frame



Detail of Centerpiece



Box HOCKEY

16" long. You may want to make a floor for the hockey frame. Don't do this until you have tried out the game and then if you want to go to the expense and trouble of making a floor, buy 36 square feet of any ordinary 1" flooring. Twelve 5" lag screws finish the material needed for the frame unless you have decided to build a floor. Then you will need about a half pound of eight-penny nails.

The hockey sticks are the only difficult things to make, but try them, anyhow. It will be wise to make one spare stick so get enough lumber for three. Oak or ash should be satisfactory. One piece 1" thick, 4" wide, and 36" long will make all three sticks.

You will need a ball too. Don't try to make one. Regulation field hockey balls are cheap enough, and just the right thing.

THE FRAME

Make the frame according to the diagram. Saw up one of the 9' lengths of 2" by 8" into 3' pieces. In one of them cut two holes and one notch as shown under the detail of the centerpiece. In the other two boards cut one hole apiece the same size as those in the centerpiece. These holes or passageways should be in the center of the board.

Now fasten the crosspieces to the 9' side pieces with the 5" lag screws. Bore holes for the screws so that they don't split the wood. The holes in the sidepieces should be large enough so the screws slide freely into them, but the crosspiece holes must be smaller for the screws to hold securely. The little triangles shown in the diagram are made of the 2" by 4". You will need eight of them each 8"

long. Screw them into the corners to brace the frame.

If you are going to put a floor on the frame just nail the 1" material on the bottom. Be sure that you get it on the right place. All four passageways in the crosspieces must be on the bottom of the frame. If you wish you can paint the whole thing. Green is a good color. House or deck paint will be satisfactory.

THE STICKS

You can make the sticks in one of two ways but I will tell you the best way first. Take the piece of hardwood and boil 8" of one end in water for at least an hour. While it is cooking get a heavy plank and drive several strong spikes into it as shown in the diagram. The spikes should stand about 4" high.

When the board is thoroughly stewed put the boiled end in between the nails as shown and slowly bend it back. Fasten it securely, then let it set. You had better leave it overnight in a dry place and then when you take it out it will be firm.

Saw the board into three pieces making three sticks. Round off the handles so they are comfortable to hold, and round off the bent part and it will not splinter. You can tape the handles and the crook to strengthen them. It is not necessary, but a bit of tape on the bent part will make the stick last a great deal longer, and tape on the handle will be easier on your hands.

If you can't bend the hardwood board, or if you have a lot of difficulty in bending it, you can saw it up into sticks and bend each one separately. This method also has its

troubles for it is hard to get all three sticks uniform. Just remember to boil the wood thoroughly and to bend it slowly while it's still steaming hot, and you will have little trouble.

THE GAME AND RULES

The object of Box Hockey is to make a goal by knocking the ball through the opponent's goal. Of course he will endeavor to keep you from doing so and will try to make a goal for himself. That's where the excitement comes in! A short time ago while I was telling a friend of this game he looked very puzzled. "But you don't have much room to get around!" he said. He was wrong. You stand outside the frame, not inside.

1. Players toss for courts. The winner chooses his place and stands beside the frame to the right of the center-piece. The opponent takes a corresponding position on the opposite side.

2. The ball is put into play by "hockeying," or "bullying," as they say in England. The bully is done as follows: The two players stand in position, one at each side of the centerpiece, and alternately strike the ground on their own side of the ball and the stick of the opponent over the ball. This is done three times while the players call: "Bully One [or "Hockey One"], Bully Two," and "Bully Three." Immediately after striking the sticks together at the third count both players try to hit the ball into the opponent's court.

3. When the ball is in play it must be struck, not pushed. The strike is made by swinging the stick towards

the ball, generally keeping the stick on the ground. It is not a foul if the stick is lifted above the ground as long as the stick is not raised above the frame top.

4. A foul is committed when either player raises his stick above the edges of the frame. There are two exceptions to this: At the bully it is necessary to lift the stick, and when the ball has passed from one court to the next the stick must be raised to clear the centerpiece.

5. A foul is committed when either player steps or falls into the playing frame or box.

6. The penalty for all fouls is the same. The opponent is allowed one free hit from the spot where the ball is at rest. While he makes his free hit the player who committed the foul must remove his stick from the line of play. Neither player can strike a free-hit ball until it has either touched the frame or come to a stop.

7. Players can move the ball from one court to the next in one of two ways: either by knocking it through the passageways in the centerpiece or by striking it in such a manner that it jumps over the centerpiece. But if the ball is knocked outside of the frame by either player it is considered a foul and the other player is allowed a free hit from the depression on the centerpiece.

8. One point is made each time a player knocks the ball through the passageway at the end of his opponent's court. After each point is made the ball is bullied again.

9. Any number of points agreed upon at the start can constitute the game. Generally game is made by the player who first makes three goals. Box Hockey is a very

vigorous game and five goals is as much as anyone would want to play at once—maybe too much!

JUNIOR BOX HOCKEY

The regular Box Hockey can be played either indoors or out. But if you want a slightly smaller game you can make a fine miniature set. That word miniature must be taken with discretion. Junior Box Hockey is a good fast game. It comes in the class with Junior Tether Ball or Table Tennis. It's a game that takes almost as much speed and endurance as its big brother, but it's not too rough to play in the parlor—if you take out all the breakables first!

Build the game just as you did the larger one but cut all dimensions in half. Use 1" by 4" lumber for the frame and $\frac{1}{2}$ " fir plywood for the floor. Get three 54" pieces of the 1" by 4", and one 20" by 54" piece of plywood. Make the sticks from a piece of ash or oak 2' long 2" wide and $\frac{3}{4}$ " thick.

If you want to make a couple of refinements you can do so. Fasten a couple of bells from worn-out alarm clocks in the goal holes. They will ring when you make a goal and will also keep you from knocking the ball through the hole into some onlooker's lap. You can play this game either with a golf or small rubber ball, or with a rubber or wooden disk $1\frac{1}{4}$ " in diameter and $\frac{3}{4}$ " thick. If you use the disk you should cut the passageways slightly wider, say, 2" instead of $1\frac{1}{2}$ ".

To play the game set the frame or the box on a table

or between two chairs. Use the rules given for the regulation game and add one to them: you must hold the stick with one hand only; holding it with both hands is a foul. If you have to add any house rules to save the furniture don't hesitate to do it!

CHAPTER IX

QUOITS AND RINGTOSS

THE games grouped here are all in the same family. The only difference between them, when you get down to barest essentials, is that Ringtoss is a little game for a small space, and that Tenpin Toss and Indoor Quoits are big games for larger spaces. They are really indoor games, but all of them can be played outside, too, as on playgrounds, and are just as much fun as inside.

They are not at all hard to make or to play, and yet there is an almost endless variety to the games that you can play with each piece of equipment. There is also an interesting variety in the kinds of craftsmanship necessary to make them. Splicing quoits is lots of fun, more fun, I think, than throwing them. And you can go on forever thinking up new kinds of targets for Ringtoss, or new ways of scoring Tenpin Toss. But I will only tell you how to make three quoit games and suggest a few of the variations. From those you should be able to build as many different games as you fancy.

RINGTOSS

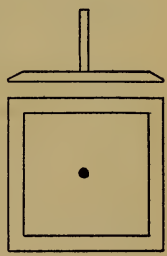
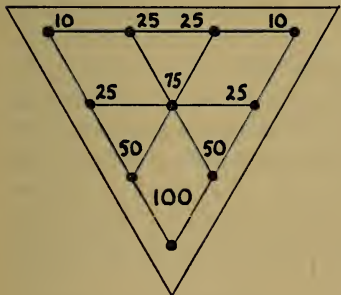
Ringtoss is a very old game, and in its original form, very elementary. When I was only three feet high we used to play it with a target made from the end of an orange crate and rubber rings from preserve jars. Then



RINGTOSS

ROPE RINGS

4" 4" 4" 4" 4" 4" 4" 4" 4" 4"



TENPIN TOSS

QUOIT STANDARD

we found that rope rings worked better, and we made larger targets to fit them. The target described below is neither the first nor the last of the many we made. But it is a good average, and would be a good one to start with.

MATERIALS

Get 18' of 1" by 4" pine or other soft and cheap wood. It won't come all in one piece, so be careful when you buy it and be sure you can cut it up into 24" lengths. At the same time get 26 screw-hooks each about 2" long with at least a $\frac{1}{2}$ " hook to them, and 16' of $\frac{3}{8}$ " manila rope. If you like you can make a lighter-weight board of $\frac{1}{2}$ " fir plywood. It will be easier to make and will cost a bit less. But the pine board will last longer if you are playing the game where it will receive hard treatment. If you are going to make the plywood board get it in one piece 24" square.

THE BOARD

If you have decided upon the pine board cut your wood into 24" lengths. Using three of these as battens screw or nail them to the other six boards, making one big board 24" square. If you are going to use plywood you will not have to put battens on the back of it. It is ready to use when you have sanded it slightly and rounded off the edges.

Each little dot in the diagram shown represents one screw-hook. Put in the hooks as shown, screwing each in about $\frac{1}{2}$ ". It might be wise to put the numbers on before you put in the hooks. Either paint the numbers, or paste on numbers cut from an old calendar. You have

one hook left over. Screw that into the top corner of the board to hang it up by.

THE RINGS

The rope rings are much easier to make than they sound. You can call them grommets instead of rings if you want to be accurate about it. That's what the sailors call them, and they were the first to make them. We just stole them wholesale.

Cut your 16' piece of manila rope into 4' lengths. Take one of these pieces and "unlay" it, as the sailors would say. In other words, unravel it carefully, dividing it into three yarns. Each yarn will make one ring—twelve rings from your piece of rope.

Now make a loop about 5" in diameter with one of the yarns and wind the end that is to your left through the loop, following the natural twists of the yarn. I've tried to draw a picture that shows how it's done. "A" is the loop. The yarn to the left is painted black so you can follow it. I've exaggerated the twists a bit to make it easier to follow. "B" shows the two yarns wound together.

When you get back to the place where you started take the other end of the yarn and wind it around in the opposite direction forming a circle of rope of three strands, just like the original piece before you unlayed it. Be very careful to follow the natural twists of the rope, never cross one strand over another, and twist them together tightly and evenly.

When you are back to the starting place with the third

yarn cut off the ends flush with one another. Then bind the juncture with a band of adhesive tape or friction tape to keep it from unravelling. Make the rest of the rings all the same size and paint the bands in contrasting colors, three rings to the color to help you tell whose ring is whose. They are ready for use now but you can improve on them by dipping them into thin varnish, shellac, or paint, and setting them aside to dry. These rope rings are infinitely better than the old standbys, jar rings. And they actually cost no more.

PLAYING THE GAME

Hang the board on a wall about five feet from the floor. Then stand back about 20' and try to loop the rings over the hooks. Use three rings to the turn, or five rings, depending on the number of people playing. I'll not give you any cut-and-dried rules for Ringtoss because you can probably make up better ones. Set the game at 100 or 500, or at ten rounds. If you think 20' is too close or too far change the distance to suit yourself.

You can vary the game of Ringtoss in many ways. One game made up by a bunch of misanthropes is called "Do-Do." Whoever rings the hook in the middle loses his whole score, becomes as extinct as the Dodo bird. Consequently the worst player wins the game. You can try "Do-Do" if you wish, or you can go the Do-Dophiles one better. If you ring a hook marked "5" you lose all for that turn. If you ring the center one you lose your whole score and have to start over. Use five rings instead of three, set the game at so many turns, and go to it. This is much

better than "Do-Do." You have to be good to get any score at all. In "Do-Do" you just have to be a bad player and ring the "5's."

TENPIN TOSS

Tenpin Toss is a Ringtoss game that is built for larger space or the outdoors. It is often more fun than Ringtoss, but comparing the two is hardly fair. Ringtoss is really a parlor game—Tenpin Toss is a gymnasium or playroom game. The diagram I've drawn and the directions I'm giving below are for only one variety of this good game. You can arrange the pins in different ways, like the pins in Skiddles, for example, or just put three pins in a triangle. Then, of course, it would no longer be Tenpin Toss and you would have to think up another name. Skiddle Toss would do for the first and Cocked Hat, reminiscent of the old bowling favorite, would do for the second. It really doesn't matter. However you arrange the pins it will still be great fun.

MATERIALS

Get 6' of 1" by 7" pine, 6' of 1" by 5", and 7' of 1" by 1" hardwood or dowel 1" in diameter. If you have a couple of old broom handles hanging around you won't need that last item at all, but probably by this time you have sawed up every broom handle in the place. In addition to the wood you will also need 15' of 1" manila rope and about two dozen 1½" wood screws.

If you'd rather make the board of plywood you may. It will be a little more expensive but will be very durable.

Get a piece of $\frac{1}{2}$ " three-ply fir 36" square instead of the pine suggested above. You will need the same amount of dowel and rope, but get 1" screws instead of the $1\frac{1}{2}$ " ones.

THE BOARD AND RINGS

If you are making the pine board, lay out the 7" material to form an equilateral triangle 32" to the side. Then, before you do anything else, mark on the face of the triangle the position the pegs are to take as shown in the diagram. Now screw battens of the 5" wood onto the bottom of the triangular board in such a way that the centers of the battens run down a line perpendicular to the base of the triangle and through the center of the peg marks. When you are putting in the screws be careful to have none where the pegs or pins are to be.

Now make your pegs. If you have chosen old broomsticks or dowels cut them up into $8\frac{1}{2}$ " lengths, round off one end of each piece and leave the other end as it is. If you are going to make the pegs of the square hardwood, plane off the corners to form an octagonal stick before you cut it into pegs.

Bore ten holes in the board to take the pegs. Make the holes small enough so that the pegs fit in snugly. Don't bore them quite all the way through. Leave about $\frac{1}{4}$ " of wood on the bottom. Before you put the pegs in paint the board whatever color you desire and paint on the scoring numbers a good 2" high in some contrasting color. When the paint is dry put a drop or two of glue on the plain end of each peg and drive the pegs into the board. Run a

small screw through the back side into each peg to hold it securely.

If for any reason you want a board that is readily transportable, if you like to carry your games around to show to the boys, you will want to build it slightly different. Someone with a sense of humor once suggested that the pegs be put on with hinges to fold up. There is a better and easier way than that.

Make the board as described with two slight differences. When you are boring the holes for the pegs leave $\frac{1}{2}$ " instead of only $\frac{1}{4}$ " of wood at the bottom. In the bottom of each peg bore a $\frac{1}{8}$ " hole about 2" deep. Then screw the pegs onto the board with large wire screws. These will cut a thread in the pegs and will hold very securely. Add a screw-driver to your traveling equipment. Take the pegs out before you go anywhere with the board, put them back in when you reach your destination.

If you have decided to make the plywood board you will have a slightly easier job. Cut two 32" equilateral triangles out of the square of plywood and glue and screw them together, one upon the other. Make the pegs and assemble the outfit as described above. It will be a good strong game that should last forever.

The rope rings are made as described on page 107. Use 1" rope instead of the smaller size suggested there. Cut it into 60" lengths, unlay the strands and start with a 6" circle. Dip these rings in thin paint or varnish and hang them up to dry. It will make them heavier and more solid, will take a touch of luck away from the game and replace the loss with accuracy.

PLAYING THE GAME

You can vary this game, too, to suit your purposes or ideas of what it should be. Set anything you want as the score and throw three or five rings at a time. Prop up the back end of the board a few inches and you will be able to see the pins better. Stand away about 40' or 50' for the first few games.

You can vary this in several ways. Make the center pin "poison" and have it cancel the score. Or make it "double" and have it double the score for that turn. If you want you can make a very exciting game out of Tenpin Toss by making the center pin "poison-double." If you get one ring of your five on it your score to that stage in the game is cancelled. If you get two rings out of the five on the magic pin the cancelled score is reinstated and doubled. The chances of ringing any single pin two out of five turns are very slim. But selfish people will try to do it—and will probably be poisoned.

INDOOR QUILTS

Indoor quilts actually came first in history of all these games in its family. But I've always put it last in importance because the real game of horseshoes spoiled it for me and I never could get very enthusiastic over it. But here it is at the tail end for those who like it.

The quilts are made just the same as for Tenpin Toss with 1" manila rope, and dipped in varnish or paint to make them heavy and solid. Four of them will be enough but when you buy your rope you will have to get enough

for six, so you might as well make half a dozen and have two spares in case any are lost.

The standards as shown in the drawing are each made of one 15" square piece of 1" pine, and a 7" peg cut from a broomstick or dowel. Bevel the edges of the bases as shown. Glue the pegs securely in. If you want a portable outfit you can make a very neat one with $\frac{1}{2}$ " plywood and two heavy 6" bolts. Get two 15" squares of the plywood, and two $\frac{1}{2}$ " bolts 6" long. Few bolts will be threaded all the way down and both of these must be. You probably won't be able to buy them that way but most plumbers or steam-fitters or blacksmiths can thread them for you. Assemble the standards by boring a hole $\frac{1}{2}$ " in diameter in the center of each board and screwing the bolts in tightly. If you counter-sink the heads so that they come flush with the board surface they will be more satisfactory. This outfit costs a little more than the other but it will probably never break or wear out.

PLAYING THE GAME

Quoits, like horseshoes, should always be played by partners. Set the standards up about 30' or 40' apart. Two of the players, not partners, stand at one standard, and the other two at the other. Toss a coin for first play.

1. The player who wins the toss opens the game by throwing his quoit towards the further standard in an effort to ring the peg. His opponent then throws one ring. Then the first player tosses his second ring, etc.

2. Points are made as follows. The ring nearest the peg counts 1. The ring second nearest the peg does not

count at all unless it belongs to the player who has the ring nearest the peg. Then it also counts 1. A ring leaning against the peg at the end of the inning counts 3 and none of the other rings count at all unless one should be a ringer or a "leaner." A ringer counts 5 points. A ringer on top of a ringer counts 10. No two players can score in the same turn. Any ringer will cancel a ringer below it and any ringer will cancel any leaner. If both players have leaners neither counts and the next nearest ring counts 1 point.

3. When both players have finished and the score has been counted the other two players are given their turn. This alternation is continued to the end of the game. The player whose team has scored last plays first in each inning.

4. Game is generally 21 points.

CHAPTER X

DARTS

THERE is something about throwing games that fascinates everybody. Maybe we inherit the desire to throw from our ancestors who had to throw stones and spears while hunting for food or defending their caves. Whatever it is the desire to throw is still strong in the human race and now that we no longer have to do it in business we do it in fun. Darts is one of the throwing games that always remains interesting.

Here I'll explain three different dart games that are all fun. One is very simple, one is complicated, and one is tricky. I'm not going to tell you how to make the darts, though, because I think you shouldn't try. Darts are little gadgets about six inches long with a spike at one end and three feathers at the other. I've never made one yet that was any good. Either the feathers fell off or the darts weren't accurate. It's not much fun making poor darts. It's much better to buy good ones.

A PLAIN DART TARGET

The picture I drew of a target is just half the size of a regular archery target. Get some white pine 1" thick, 7" wide and about 10' long, and another piece 3" wide and 7' long. Make a board of the 7" wood measuring 28" square. Screw the 3" wood onto the back as battens. Then

draw the bull's-eye as shown in the diagram. The circles are painted yellow, red, blue, black, and white as indicated. The scoring is 9, 7, 5, 3, and 1. The space outside of the target is just for a back-stop and counts nothing.

If you want a target that is more substantial you can make it in several ways. Just cover the back-stop described with heavy linoleum or cork composition flooring and paint the target on that. Or make a target of linoleum and plywood. For the plywood target you will need a 28" square piece of $\frac{1}{2}$ " fir veneer and a piece of linoleum the same size. Glue the linoleum firmly to the board and let it dry for a day or two under pressure. Then paint the design on the linoleum. This board will be light and durable and handsome, and in many ways superior to the other, but it does cost more.

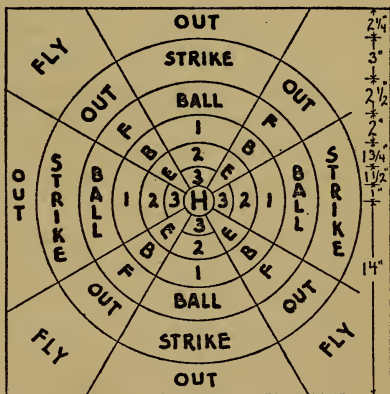
You had better get twelve darts when you buy them. The Apex Manufacturing Company at Norristown, Pennsylvania, has fine ones at less than a dollar a dozen. Probably your local sports store carries them just as cheaply.

Before playing the game search out a free space either indoors or out where you can toss the darts around carelessly without hitting anyone. Of course, you won't want to toss them around carelessly; in fact your first rule should be against it for a dart can inflict a very painful wound. So be sure, above all things, that nobody can possibly get in the way of the darts. Then proceed with the game.

You can make up your own dart games and your own



BASEBALL DART TARGET



rules. Set "game" at either a given number of points or a definite number of turns. Stand about 20' to 30' from the target and throw six darts. Count the score, retrieve the darts, and give them to the player second in turn. Then stand *behind* him while he plays, and let *him* fetch his own darts at the end of his turn. One of your first rules should be that every player gets his own darts. Then there will be little chance that anyone will get hurt.

BASEBALL DARTS

Baseball Darts is a game for the baseballophile. I won't go into a lot of detail telling you how to make it because you can follow the design easily enough from the picture and the construction is just the same as for the regular target. If you have made the plywood target as suggested above you can face the back side of it with some more linoleum and paint the diagram on that!

The "H" means a homer. The vertical numbers are base hits, and the horizontal ones "steals." If you steal a base when there is a man on base it counts for an out and the man who steals is retired. If you make a base hit with men on base already they move up to accommodate the chap who swatted the ball. "E" means error, and since it's the fault of the other team every man steals a base. "B" means ball and "F" foul, and you already know what to do about it if you happen to get them. All the "Out" sections apply only to men on base. "Fly" is an out for the man at bat. Otherwise play this just as you would regular baseball except that the man who pitches is really the batter.

You can choose sides if you wish and the members of the team can throw in turn. Players are not confined to any specific number of darts. They throw until they make a base hit, a fly, strike out, or make a base on balls. Then the second man of the same team is up, and the third, and so on until the team makes three outs. Now the other team is up. Play nine innings.

If there are only two players each one throws until he makes three outs. Pick your own distance to throw from. About 20' to 30' will be good to start on. Follow all the safety rules and suggestions given for the regular game. And don't become worried and decide that these dart games are too dangerous to play. They are very safe if properly handled.

A NOVELTY TARGET

You can have a lot of fun by putting a buzzer arrangement on either of the targets. In the very middle of the target bore a hole 2" in diameter. Get a large cork or round piece of white pine that will just fit into the hole. The plug should be about 2" deep and should slide easily but snugly through the hole in the target. Now, behind the target, mount a small knife switch as shown in the diagram. The switch can be bought in a ten-cent store and the smaller it is the better it will be. Fasten the handle of the knife to the center of the plug with a wire staple. Nail in a small wooden stop as shown.

Now hitch up the switch with a dry cell or flashlight battery and a small buzzer or bell. Paint the end of the plug black so you can see it against the gold, or paint it

black with a white "H" for the baseball game. If the buzzer is for the regular target have it count 15, or have it double the total score for that round.

When you hit the plug with the dart the impact will push in the switch and start the buzzer. The buzzer will keep on buzzing until you pull the dart out and open the circuit. It makes the game of darts very exciting. No disputing when you hit the bull's-eye! Your success is advertised for the whole world to hear.

CHAPTER XI

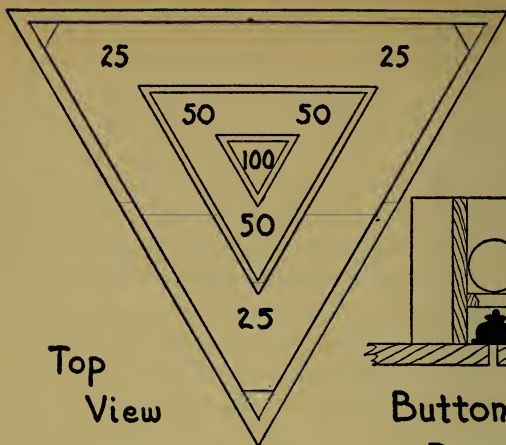
BUZZ BALL

BUZZ BALL is rather a gentle game compared to the rest in this book, but it is also a versatile one. It can be a throwing, a rolling, or a bouncing game, whichever you prefer, and can be adapted to nearly any play situation. The throwing and bouncing games can both be played with the same equipment, but for the rolling game you will need two slight additions. I'll describe the simplest for you first, then will tell you how to add a gadget that will double its usefulness.

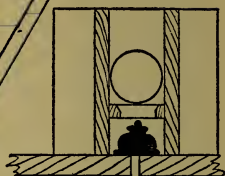
MATERIALS

For the bouncing game you will need 6' of 1" by 8" pine or other cheap non-brittle wood, 9½' of 1" by 6", and 7' of ½" by 5". If you are going to make the combination game get 9' of ½" by 6" wood in addition to the list above. You can also make this game of fir plywood and probably get out of it with a little less expense.

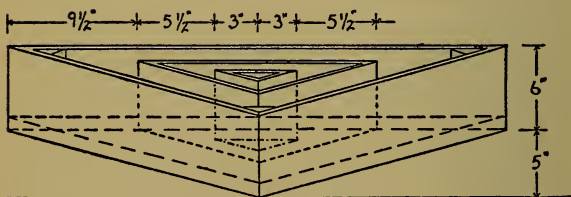
In addition to the wood you had better get a half pound of eight-penny nails, two dozen 1½" small wire screws, and a small can of whatever color paint you want your game to be. The buzzer arrangement suggested below is not absolutely necessary but adds a great deal to the fun of the game. You can make this addition with one cheap



Top
View

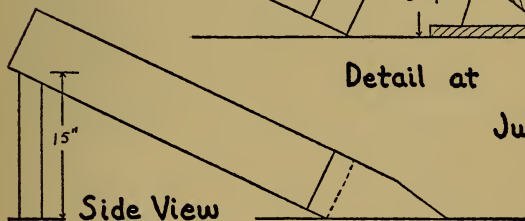
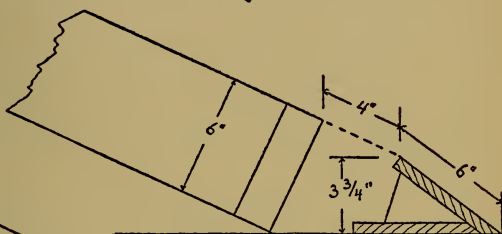
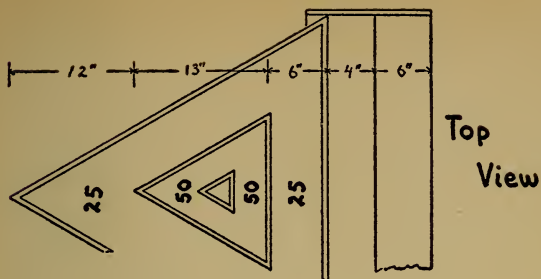


Button
Detail



Front View

BUZZ BALL



JUMP BUZZ BALL.

old-fashioned door-bell button, one dry-cell, one cheap buzzer or door-bell, and a little wire.

THE BOUNCE GAME

Make a triangular box as shown in the diagram using the 8" wood for the bottom and the 6" wood for the sides. The 5" by $\frac{1}{2}$ " wood is for the smaller inside boxes. Nail the 6" wood securely to the sides of the triangle and you will need no braces or battens underneath. Make the little triangles and screw them to the bottom of the large box. If you have any zinc or tin flashing, such as they use to keep the rain from running in the chimney, cut it into 3" strips and screw it to the corners of the triangles for reinforcements. If you have no flashing you can cut up some tin coffee cans and it will do just as well.

When the box is finished mount the button and buzzer. Cut out the little triangular piece with the 2" hole in the middle. Be sure that it fits snugly into the smallest box and centers on the button underneath. When a tennis or baseball is dropped into the box it should press against the button and ring the bell. Tennis balls may be too light to press the button. Test it ahead of time and if you find this is so file away the spring a bit so that it will work.

Paint the sides and bottom of the box in contrasting colors and letter in the scoring numbers. The game is ready to play.

Prop up the back end of the box slightly. Stand about 20' from the apex of the triangle and try to bounce a ball into the box. You can use five or three balls and score according to the numbers marked in the section that you

get into. If you bounce a ball into the center section it should ring the buzzer.

Plain soft rubber balls about the size of tennis balls are just right for this game. Tennis balls will do if you have filed down the buzzer spring. Baseballs will not bounce easily enough but you can use them in the throwing game. In fact, you can use any of these three balls in the throwing game. Just toss them instead of bouncing them. You can play this game with bean-bags, too. Throw them into the box, but don't try to bounce them. They won't ring the buzzer unless you fix the button. Just make another small triangular piece of wood that will slide freely up and down in the center box. Screw a short dowel or plug on the bottom of it so it will press down the button when you score a bull's-eye.

THE ROLLING GAME

If you want to roll things at this contrivance you will have to make a few additions. Build the triangular box just as described above. Paint the scoring numbers upside down, then turn the box around so the base is towards you and the apex away from you. Fasten a single leg to the apex to hold it up about 15" from the floor, making the box stand with about a thirty degree angle.

Now build the little ski-jump from the extra lumber that I suggested you buy. Make the jump about 3' long, built like a small trough spread by three triangular pieces of 1" board measuring 4" by 4" by 2½". Then attach this trough or jump to the big box by nailing two boards to its base and the base of the box. Put the jump about

12" away from the box, and be sure that when the whole contrivance is set flat on the floor the trough points away from the box as shown in the diagram.

Now get about 20' away for a start and roll baseballs or soft rubber balls at the box. They will hit the ski-jump, hop into the air, and land in the box. Set whatever you want for the score and take turns rolling three or five balls. Or, if you wish, set a definite number of turns as game and the player with high score wins.

CHAPTER XII

EXO AND BLACK DIAMOND

Exo and Black Diamond are two games that are as old as history, and yet are ever new. The two are played almost alike but I'm including them both here so that you can choose the one you want to make and play. They are both interesting and often exciting games; both are simple, yet complicated just enough to pack them with suspense.

The object of the games is to toss rings or disks at a board and make a score. But life isn't always rosy and neither are the games. If the disk lands in the wrong place there is a bit of tragedy. But as two wrongs often make a right, in these games you can recoup your losses by cancellation. The games are full of chance. You never know from one moment to the next what you are heading for.

Exo

Exo is a direct descendant of the old shipboard game Bull Board. I've added one more count to it and a couple of misfortunes as added complication. But, if you'd rather, you can forget them and make the board with the regular Bull Board design.

MATERIALS

For Exo you will need only the simplest materials. An 8' piece of 1" by 8" pine and a 6' piece of 1" by 6" pine,

or a piece of $\frac{3}{4}$ " fir plywood 24" wide and 30" long. The fir board will probably be a little cheaper than the pine board but will be no better. In addition to the lumber get a small can of black paint and some varnish, 16' of 1" manila rope, and, if you are making the pine board, 30 $1\frac{1}{2}$ " wood screws. If you'd rather throw wooden disks than rope rings forget the rope order and get a piece of maple or other hardwood measuring 1" by 5" by 60". And that's all.

THE BOARD AND RINGS

If you have decided to make the easy fir plywood board sandpaper the wood smooth, round off the edges slightly, and skip the rest of this paragraph. But, if you are going to make the pine board you will have more work ahead of you. Cut the 8" pine into three 30" lengths, and the 6" pine into three 24" lengths. Use two of the 24" pieces for battens and screw them securely to the 30" wood, one at each end. Now you will have a board that measures 24" by 30" with two battens on the underside. Use the third 24" piece to prop up one end of the board. Either screw it onto the underside of the board, bracing it against the upper batten, or fasten it on with two light hinges. The latter method is the best because when the board is not in use it can be folded up and stored in a smaller space.

When the carpentry is finished and is neatly sanded you can paint on the diagram. Use the black paint for that, putting in the lines about $\frac{1}{4}$ " wide, and the numbers as large as you like. You can make a much more interesting outfit if you paint the X's in red or some other con-

	10	
4	9	2
3	5	7
8	1	6
	10	

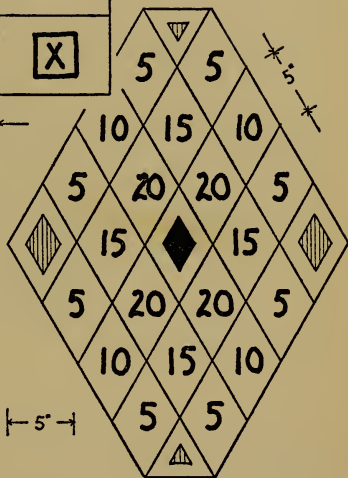
6"
6"
6"

Exo

8" 8"

BLACK
DIAMOND

4 1/4"
17"



5"

trasting color, or if you paint the squares red and the X's black. When the paint is dry give the board two coats of varnish to preserve it.

Rope rings are better than wooden disks and you can use them for many other games. Look up the instructions for making grommets on page 107 and follow them closely. Five-inch rings will be the best size so cut the 16' piece of manila rope into four even pieces. That will make twelve rings, two to spare. When you have finished the rings dip them into varnish or thin paint to give them weight and solidity. Then when the paint is dry mark a black band around half the rings and leave the other half plain.

The wooden disks are harder to play with than the rope rings but I'm including them here because so many people seem mortally afraid of trying to splice rope, and would much rather saw out disks. Just mark the circles on the hardwood and cut out the disks with a keyhole saw. Paint half of them black and leave the other half plain. You will need ten altogether. Large rubber washers would be better than either rings or disks. Unfortunately you can't make them and they are rather hard to get. They are expensive, too.

THE RULES

Set the board up with a prop under it to make it about 6" higher at the far end than at the near. Then mark a throwing line about 15' away from the bottom of the board. After a few games you will be able to pick a distance that might better fit your abilities. But start with

15', anyway, and then change to whatever you think better.

There are two games that you can play with this board. One is Straight Exo, and the other is Sequence Exo. The straight game is a good one to begin on, but the sequence game is often more interesting and takes more skill. The rules for both are the same except for the scoring.

1. To start players either toss a coin or throw one ring at the board. The player whose ring lands on the largest number is given his choice of color. The player with the black rings opens the play.

2. Players take turns tossing their rings at the board. Each player is allowed five rings. When all rings are thrown the "inning" ends.

3. In tossing the rings either an overhand or an underhand throw is permissible. The underhand toss, however, will probably be found more accurate. A foul is called when either player steps over the line while throwing his rings. The ring with which the foul was committed is considered dead for the remainder of the inning and does not count in the scoring.

4. Points are scored according to the numbers on the spaces where the rings are at rest at the end of the inning. The higher number counts if the ring overlaps a boundary line. A ring is considered overlapping if the line is visible on the inside of the ring. Or, if disks are used, the higher number is counted when the disk actually is partly within the higher-numbered space.

5. No points are scored for an inning when a player's ring lands in any area marked by an "X." But if two

"X's" are scored in one inning they mutually cancel. If a player scores three "X's" the total for that inning is doubled, and if he makes all four "X's" his total score is doubled.

6. The game is won when either player reaches a total score of 100, or when a previously determined number of innings has been played. A third alternative is to play by innings. When this method of scoring is used a player gains one point for each inning won. The first player to win six or more innings with a lead of two wins the game.

The last method of scoring will necessitate a change in Rule 5. One "X" scored will cancel only the disks played in that inning before the "X" was made. Two "X's" mutually cancel. Three "X's" double, as before. But four "X's" count as two won innings.

7. If more than two people are playing Exo, Rule 2 must be changed. Each player is allowed to throw all his five rings during his turn. Then the rings are retrieved and the next player is up. This game can also be played by partners. Each partner throws against a member of the opposing team. Scoring is the same as above.

SEQUENCE EXO

The sequence game is slightly different from the straight game described above. In this the object is to so toss the rings that you score from 1 up to the upper 10, then the lower 10 back to 1 again, and the four "X's" taken in the following order: upper right, upper left,

lower left, lower right. The game is won by the first player completing the tour of points.

Rules 1, 2, 3, and 4 are the same as above with one slight exception in Rule 4. When playing Sequence Exo the "higher number" is considered as being the number next in the line of play, instead of the number that is actually numerically higher.

5. A point is scored only when it is in the proper order. If one "X" is thrown in an inning the player must go down one point or number. If he throws two "X's" he goes back up again. If a player throws three "X's" he must start all over again or return to 10 if he is on the way down. But if he throws all four "X's" the fourth cancels the third, the second cancels the first, and the player has only one ring left that will do him any good. This rule is quite different from Rule 5 above. Of course, when a player is trying for an "X" this rule does not hold unless he scores the wrong "X."

The sequence game requires considerably more skill than the straight game. Each toss must be accurate if it is going to count at all. But in the straight game almost any toss that actually lands on the board will add to the score.

If you want to count points in the Sequence Exo you can do so. Just give the numerical value of each point scored to each player. The winner will have 110 points and four "X's." The losers will have the same score less the "X's" and points that they are behind.

BLACK DIAMOND

Black Diamond is the same kind of game as Exo. The only difference is in the scoring and the shape and design of the board. As a target game it is more honest than Exo or Bull Board because the player scores in direct proportion to his nearness to the center. Black Diamond is for people who like to shoot at bull's-eyes, Exo for those who like knocking tin cans off the back fence.

MATERIALS

You will need 7' of 1" by 8" pine for the face of the target and 4' of 1" by 6" for the battens. You can make this board of plywood, too, if you wish but it will be rather expensive because there will be a good deal of waste. You can use the Exo rings for this game, or if you haven't made the Exo outfit you can make rings from 16' of 1" manila rope. Thirty 1½" wood screws, some varnish, a little black paint complete the list.

THE BOARD AND RINGS

It is better to lay the facing boards on a diagonal in the direction shown by the divisional lines in the diagram. Lay out the diagram on a piece of heavy wrapping paper. It will help to guide you when making the board. Cut the 8" material to the shape of the face and screw battens on the bottom of the board making a frame that goes around the bottom-side of the board at the edges. You will have a little wood left over. Make a step of this to hold the upper end of the board about 6" from the floor,

and two smaller steps to put under the shaded diamonds to hold the board steady. Screw these on. Sandpaper the board, mark the boundary lines, and put on the scoring numbers. Varnish the whole board to protect it and make it handsome. If you prefer you can make the numbers from large calendar dates; glue them onto the board and varnish over them.

The rings are made as described on page 107. Cut the rope into four 4' lengths, unlay the yarns, and splice your grommets. Dip the finished rings in varnish or paint to strengthen them. Mark half of them so that you can tell them from the other half. You will need only ten rings but you will have enough rope for twelve, so you might as well make the other two and have them on hand if any should be lost.

PLAYING THE GAME

Set up the board and mark a throwing line about 15' from the base. The distance suggested is only a starter and can be changed later to suit yourself. The object of the game is to throw the rings at the board to score as many points as possible. The rules of play follow.

1. Toss a coin for color. The player winning black opens the play. Players take turns throwing one ring at a time until all ten rings have been tossed.

2. A foul is called when either player steps over the line while throwing a ring, or whenever either player throws out of turn. A ring foully tossed is considered dead and does not count in the score.

3. Points are made according to the count of the area

where the ring rests at the end of the inning. If a ring overlaps a boundary line it counts for the larger score providing the player can see the line on the inside of the ring. If the Black Diamond is made the player's score for that inning is doubled. If any other diamonds, or either of the triangles are scored the player's score for that inning is zero. But if two diamonds or two triangles are scored they mutually cancel. The Black Diamond is cancelled when the other diamonds or either of the triangles are scored upon.

4. The game is won by the player who first reaches 150, or by the player who has the highest score at the end of a previously determined number of innings.

CHAPTER XIII

NINE HOLES

NINE HOLES is the descendant of a very old English game that the boys of Elizabeth's time used to play in the open fields around London. Like all old games that have lived on through the years it is very simple, and yet remarkably versatile. It can be made in a dozen ways and played in a dozen manners. It is a good game for the outdoors in the summertime, and an interesting game for the many winter nights or rainy days that you have to spend inside.

The basic principle is one of the oldest in games. You roll a ball into a hole; you are given a score for your successful efforts. Just change the manner of propelling the ball, vary the arrangements of the holes into which you must roll it, and you will have an entirely new game. Golf and Billiards, Bagatelle and a hundred other games that you'd never think of connecting with Nine Holes all came from the same root! It has infinite possibilities.

But without wandering so far afield Nine Holes, itself, has changed many times, and yet has always remained very much like its beginnings. In Shakespeare's time they turned it into "Troll My Lady" and "Pigeon Holes" and "Trunks." In modern times they have called it "Crow-Ball" and other less interesting names. So you can call

your own version whatever you wish. It's the game that counts, not the name.

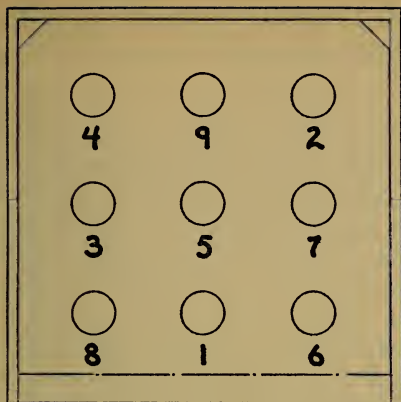
There are two usual ways to build Nine Holes. The original way was to cut holes in the ground and roll wooden balls into them. You can improve on that for your outside game by burying coffee tins in the ground to form a square, each tin about a foot apart and numbered as in the diagram. Or you can make the outfit for which I've drawn the picture. It's built of wood and can be played either indoors or out.

There are three different sizes for the wooden Nine Holes game. The diagram is for the largest set to be played with croquet balls. But if you cut the dimensions exactly in half you will have a fine game to play with golf balls. Or you can cut the measurements to one-third and play the game with marbles! The directions following are for the big outfit. The smaller ones are made in just the same way.

MATERIALS

For lumber you will need 10' of 1" by 7" pine or other cheap easily worked wood, 7½' of 1" by 4" pine and a little piece of the same wood measuring 2" by 2" by 4". The smaller games can be made of ½" or ⅜" fir plywood but I've never found it satisfactory for the largest set. In addition to the lumber you will need two dozen 2" wood screws of about #8 wire, a few 2" finishing nails, and a small can of black paint.

Of course balls will be necessary, but you won't be able to make them without a lathe. Half a dozen croquet balls

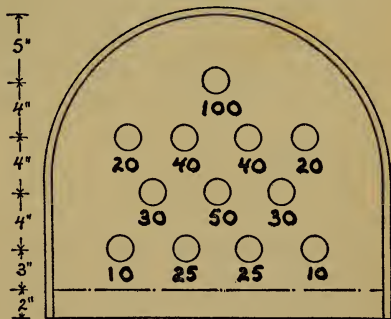


$5\frac{1}{2}"$
 *
NINE
 *
 8"
 *
 8"
 *
 $4\frac{1}{2}"$
 *
 2"
 *

$5\frac{1}{2}"$ * 8" * $13\frac{1}{2}"$

5" * 7" * 12"

TWELVE
HOLES



$5"$
 *
 $4"$
 *
 $4"$
 *
 $4"$
 *
 $3"$
 *
 $2"$
 *

will fill the bill very nicely and can be used for many more games described in this book.

THE BOARD

Saw the 7" wood into four 29" pieces, and cut the 4" pine into three pieces for a three-sided fence around the board as shown in the diagram. The two little triangles in the upper corners are for reinforcements and can be made from the 2" by 2" stick or almost any other odd piece that you may happen to have around. Mitre the fence boards to fit snugly as shown at the top of the picture. Then screw them to the top of the floor-boards with the 2" screws. Set in the triangles, and tack the corners together solidly with the finishing nails.

Now you will have a three-sided box-like affair. Bevel off the floor at the open end as shown by the dotted lines in the picture. If you like to roll the balls smoothly bevel the board pretty thin. If you like to make the balls take a little bounce before they score just round off the corner. A spokeshave is the ideal tool for doing this job, but if you haven't got one you can use a jack-knife or a chisel or a draw-knife.

Now cut the nine holes in the board as shown in the drawing. If the balls you intend using are regulation croquet balls the holes should be about $2\frac{1}{2}$ " in diameter. This will not allow the balls to fall through, but if the edges of the holes are slightly rounded they will hold the balls in place when you roll them properly into the holes.

Sandpaper the box and paint it any color you like.

Mark on the scoring numbers. Make them large and plain so everybody can see them. That's all.

PLAYING THE GAME

The object of Nine Holes is to roll the balls along the floor or lawn into the box in such a way that they will come to rest in one of the holes. There are two ways to play this game or, rather, two games that you can play with the same board. The general set-up for both is the same.

At one end of a clear space about 6' wide and 20' long set up the board. Prop the upper end about 6" from the floor to give it a good slant. Mark a bowling line about 12' or 15' from the beveled edge of the board. If only two are playing follow the first four rules given below. If more than two are in the game you will have to play slightly differently as described in Rule 5.

1. Toss for play. Each player is allowed three balls. The two players alternate bowling until each has bowled his three balls.

2. A score is made when a ball falls into one of the holes. The player making the score is credited with the points marked below the hole. But if the second player bowls in such a manner that the first player's ball is knocked from the hole where it was at rest it does not count unless it falls into another hole. The balls score according to their positions at the end of the inning.

3. A foul is committed whenever a player steps over the bowling line or tosses a ball instead of rolling it. The

ball bowled during the foul does not count towards the score.

4. The game is won when either player scores a total of 100 points, or when a previously determined number of innings has been played.

5. If three or more are playing each player is allowed all six balls and bowls them in succession. At the end of a player's turn his score is computed and the balls are retrieved for the following player.

If four or six people are playing they can divide into teams. Members of one team bowl against members of the other. Scoring is the same as described under Rule 2.

SEQUENCE NINE HOLES

The Sequence game is often more interesting than the simple game given above. The set up and manner of bowling are the same, but the scoring is different. In Sequence Nine Holes the balls must score from 1 to 9 and back to 1 again. The player who first completes the tour of points wins the game.

Rules 1, 2, 3, and 5 are the same for both games except for one change in Rule 2. A score does not count at all unless it is in proper order, and a player cannot consider a number bowled in a previous inning as counting in the present inning. But if at the end of an inning a ball still stands in place it is acceptable for the score if it is in the proper order whether it was rolled before or after the ball preceding it in number. For example: If a player should have reached 5 in one inning and rolls both a 6

and a 7, the 6 and 7 count whether the 6 was rolled first or not.

Rule 4 is, of course, entirely different. The player who gets back to 1 first wins the game. Points can be counted by giving each player credit for the numerical value of each point made, or by giving him one point for each ball that he has scored. By the first method the winner would have 81 points, by the second method he would have 17 points.

TWELVE HOLES

Twelve Holes can also be made in two main ways, either in the ground or of wood. Like Nine Holes it can be built in three different sizes, each a lot of fun in its own place. You can build a big set following the measurements in the diagram, a golf-ball outfit by cutting the measurements in half, or a marble game one-third the size shown.

MATERIALS

For the big set you will need a piece of fir plywood about $\frac{3}{4}$ " thick, 24" wide and 22" long, and a piece of $\frac{1}{2}$ " spruce or other easily bent wood about 6' long and 4" wide. If the lumber-dealer doesn't happen to have spruce on hand he will probably be able to pick out some other wood that will do as well. Have him bend a piece in a half circle to show you how good it is. If it breaks don't take it.

A dozen $1\frac{1}{4}$ " wood screws of #6 or #7 wire and a small can of paint will complete your requirements. The game I've drawn for you is too small for regular croquet

balls. Six soft-rubber balls like the ones sold for a dime in the ten-cent stores will be just right.

THE BOARD

With a compass-saw cut out the plywood as shown in the diagram. All measurements given are for the bottom-board. The thickness of the strip around the edge is left off. Cut out the holes, too, making them small enough so that the balls will not fall through, but large enough for the balls to rest securely in them. Round off the edges of the holes, and bevel the straight edge of the board.

Then put on the outside strip. If you have spruce bore twelve holes near one edge for the screws and then set the piece of wood in a bathtub of warm water to soak. After about half an hour take the board out of the bathtub and screw it to the edges of the floor-board. When the spruce is dry and firm sandpaper the whole affair and mark on the scoring numbers.

THE GAME

Set up the board either indoors or out just as described for the Nine Holes game. Follow the same rules, too, except, of course, you will not be able to play the sequence game. If you want you can count the 100 as a double, and have it double the score for any inning in which it was rolled. This will not count for much if you are using only three balls. But when six balls are being played it adds a lot of excitement to the game.

CHAPTER XIV

TABLE TENNIS

HERE is a game that belonged to the "gay 90's" but it is just as good a game today as it ever was, and probably even more popular. In New York City the Table Tennis Association has an annual tournament that is often very exciting, and probably in your own home town players either have a tournament or are just waiting until someone with initiative starts one. But this is only one phase of Table Tennis, and by no means the only one. A better indoor game is hard to find, for Table Tennis requires speed and skill, and yet it's not too rough a game to play in your parlor.

If you haven't a large kitchen table, or some other fairly long and sturdy table, and are going into the serious business of homemade games you ought to make the table anyway. You can use it for all sorts of games besides the one it is planned for. It's just the right size for all the other table games described here, for Shuffleboard, Tenpins, Disk Croquet, and the rest. But Table Tennis is a good game apart from all these others. It's a lot of fun in itself and you really should make it.

MATERIALS

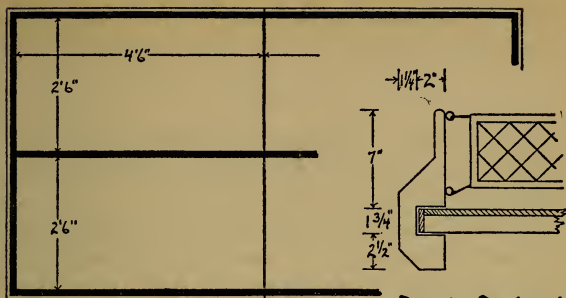
There are several different kinds of tables. The one shown in the picture has a folding middle and folding

legs and can be stowed away in a very small space. You can make it to fit on two saw-horses like the old tables they used at church suppers back in the home town, or you can make just the table top and set it on the dining-room table. You can build it of almost any kind of lumber; but here I'll describe the best way and let you decide for yourself how you want to do it.

Get two pieces of plywood $\frac{3}{8}$ " thick by 54" by 60", two 10' pieces and two 11' pieces of $1\frac{1}{4}$ " by $1\frac{1}{4}$ " pine, two pieces of $\frac{3}{4}$ " by $1\frac{1}{4}$ " pine 6' long for diagonal cross braces, and two pieces of $\frac{1}{4}$ " by $1\frac{1}{2}$ " pine 15' long for trim. That is all the wood that you will need for the table top. In addition three strong hinges will be necessary, a quarter pound of 1" wire brads, four dozen $1\frac{1}{4}$ " wood screws of about #6 wire, and a small can of glue.

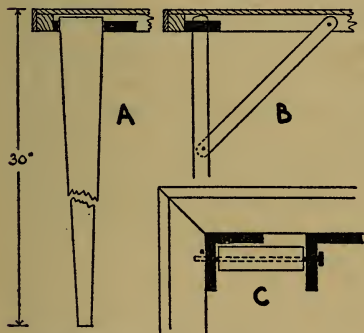
If you are going to make the folding legs you will need six pieces of pine or hardwood 30" long, 3" wide and 1" thick, 12' of $\frac{3}{8}$ " by 1" oak or maple, and either six strap hinges or twelve 3" iron angle brackets. If you get the hinges you will need screws to fit them; if you get the brackets you will need two dozen $1\frac{1}{4}$ " wood screws and six twenty-penny nails.

Get one piece of $\frac{1}{4}$ " good-grade plywood measuring 24" by 11" for the paddles, and one piece of $\frac{3}{8}$ " white pine 12" long and 6" wide. You can cut both posts from a single piece of hardwood $10\frac{1}{2}$ " long, 7" wide and $\frac{3}{4}$ " thick. For the net you will need a piece of strong cheesecloth or mosquito netting 60" long and 6" wide, and about 12' of 1" cotton tape.

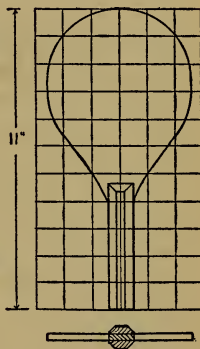


Post Detail

Court Layout



Detail of Legs



Paddle

TABLE TENNIS

That's all! And though it looks like a lot of items each piece is small and the total cost will be surprisingly low.

THE TABLE

Make the table top in two sections measuring 5' by 4' 6". Later on you will fasten the two sections together with hinges. Use the 1¼" by 1¼" wood as side pieces. Screw the plywood to a frame of this wood, running the plywood up flush with the sides. Then tack on the ¼" material as shown in the diagram. It will make a very neat job, a nice trim. Use plenty of glue while assembling the table. Glue the top to the frame, and glue the corners of the frame together before you fasten them with screws. Then put in the braces, running them diagonally across from one corner to the other. They are put in to keep the table top firm and solid. Don't nail the top to them as it will spoil your playing surface. Glue it on solidly. Set the hinges slightly into the frame-wood and when the table is open, the two joining edges will fit flush together. Be careful to put the hinges in the right place so that the table when finished measures 9' by 5'.

You can set this table on almost any dining-room table, or you can put it across three saw-horses. However, the best way is to make legs for it and let it be independent. Cut the legs out as shown under "A," leaving them 3" wide at the top but only 1¼" or 1½" wide at the bottom. Two of the legs are for the middle, one to each section, and fold in when finished. The end legs fold down the length of the table.

You can either hinge the legs or fasten them as shown

under "A." The two black "L's" are iron brackets screwed securely to the table. Bore a hole through the leg as shown by the dotted line, and fasten the legs to the brackets with a 4" spike or iron bar.

Cut the thin piece of oak into twelve 12" lengths, and round off the end of each stick. These are for the braces as shown under "B." Bore a $\frac{1}{4}$ " hole in the end of each brace. Fasten one end of each to the side of the table, leaving it loose enough to swing easily, and hook the other end over a round-headed screw protruding $\frac{3}{8}$ " from the table leg. If you put two braces on each leg the table will stand very steady when it's set up.

Stain the top of the table green and paint on the $\frac{3}{4}$ " white lines as shown black in the diagram. Paint or varnish the trim and legs to suit your fancy. The whole thing will be finished in half the time you expected to take.

THE PADDLES AND NET

You will need two paddles for the singles game and four for doubles. They are easy to make if you follow the diagram. Use the $\frac{1}{4}$ " plywood and mark it off with the 1" squares as shown. Draw in the outline of the paddles, including the handles, and cut them out with a coping- or compass-saw. Then make the two pieces for the handle from the $\frac{3}{8}$ " pine. Glue them on and tack them down with small wire brads. Let the glue set under pressure.

If you want a really high-class paddle you can cover the face with #1/0 sandpaper. Don't varnish the handles. Just smooth them up with sandpaper and they will be very comfortable. Varnish will be sticky in warm weather

and if you have any fair maidens around with delicate hands it will give them blisters.

Cut the posts from the $\frac{3}{4}$ " hardwood as shown in the diagram. Round off all the outside edges and the small part of the post. Put a $\frac{1}{2}$ " screw-eye $\frac{1}{4}$ " from the top, and another 1" from the bottom. You will not have to secure these posts to the table. When the net is drawn tightly it will hold them securely. Two posts are all that you will need.

If you haven't made the table and are going to use the dining-room table make the posts as described but change the measurements of the notch to fit your own table. Or, if you wish, just make two 7" posts from an old broom handle, fit them into round bases 3" in diameter and $\frac{3}{4}$ " thick, and fasten them down to the table with plain "C" clamps.

Make the net of the cheese-cloth that I suggested you buy. When finished it should measure 4' 9" long and 5" wide. Trim the edges with tape and let the top and bottom tapes run over about 6" or 7". Use the spare tape to tie the net to the posts.

I haven't told you how to make the balls. There are two reasons for this. The first is that I haven't the slightest idea how, and the second is that you buy them in the ten-cent store much cheaper than you can make them even if I did find out and tell you all about them. If you can't get them in your own town most mail-order houses will carry them, or you can buy them from Parker Brothers, in Salem, Massachusetts.

PLAYING THE GAME

Different people use different rules in this game. I always played according to tennis rules and had a lot of fun. But recently I've discovered that I wasn't doing it in the right way. The Table Tennis Association has a whole set of rules that they are trying to make standard. You can use theirs, which I'll give you briefly, or you can use mine. To tell the naked truth they amount to just about the same thing when you analyse them!

1. Service is decided by tossing a coin or by arguing about it. The serve alternates every five points until 21. Then, if neither player is 2 points ahead of the other, the serve alternates every point until the game is won.

2. To make a good serve the player must throw the ball into the air, strike it with his paddle so it bounces off his own court, over the net to the half-court on the other side. At the moment he hits the ball the paddle must be behind the table and in an area bounded by imaginary lines drawn on forever along the sides of the table. If a player hits the net with the ball during his service and it bounces over into the other court he must take another serve. If he repeats, a point is given to his opponent.

3. Service alternates between courts. The first service must be made to the opponent's right half-court, second service to the left half-court, etc. If a player serves to the wrong court it counts one point for the opponent.

4. If a player fails to make a good service by missing the ball, knocking it into the net, hitting it out of bounds,

or breaking either Rule 2 or Rule 3, one point is given to the other player.

5. If the service is successful the opponent or "receiver" must try to return the ball by hitting it with his racket so that it goes over the net and strikes the server's court. Then the server must try to return it to the receiver. This alternation, or "rally" as it is called, continues until either player fails to return the ball. One point is given the last player who returns the ball properly.

6. When the ball is not returned properly service begins again as in Rule 2.

7. Game is won by the first player reaching 21 points with a 2 point lead. If a player is only 1 point ahead at 21 play continues until one or the other has a lead of 2.

These are all the more important rules. There are others having to do with matches, etc., and what to do when the ball goes up your sleeve. If you want the whole rule book write to the New York Table Tennis Association at 250 West 45th Street, New York City. They will probably be glad to send it to you.

You can play several other games with this same equipment. A doubles game, as in tennis, is a lot of fun. Or you can play a rather insane game with any even number of players. Divide your players into two teams. After the first player serves he passes his paddle to the next in line. This player must return the ball if it comes back from the other team. Keep it up until point is made or the game is won.

CHAPTER XV

BAGATELLE

BAGATELLE is a very ancient game. No one seems to know just where it originated, though it probably was developed from some game similar to the English Nine Holes. It has been played in one manner or another for centuries, and through the centuries it has changed many times. Below I'll describe the most modern of them all, a small table game that holds more continuous suspense than any other game I've ever played.

The first Bagatelle that I ever made was from a soap box and a spring from an old toy cannon. But we had a lot of fun with it and were so intrigued by the game's possibilities we made a better one, and still a better. I'll write up only the best one for you, but if you want to substitute for any of the materials don't hesitate to do so. You might easily produce a better and cheaper game, and it will be your own.

MATERIALS

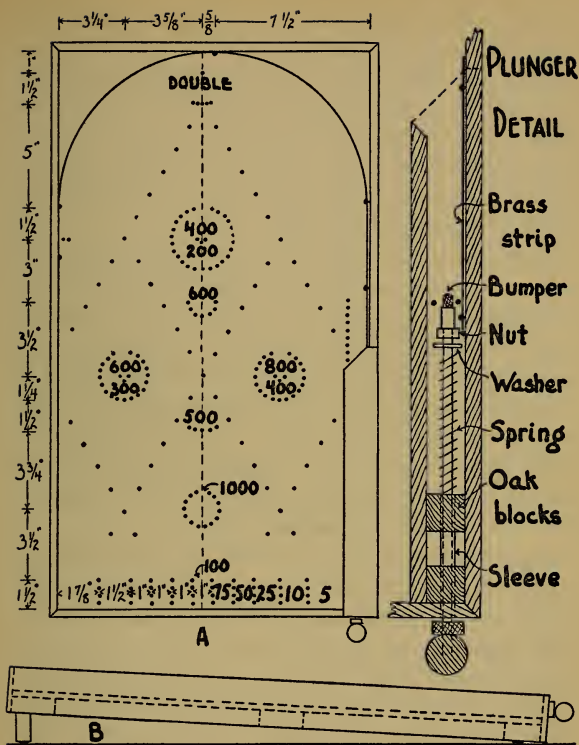
The best Bagatelle boards are made of plywood. Fir is as good as any and will be the cheapest. Get a single piece $\frac{3}{8}$ " thick, 30" long and 24" wide. You will need two other pieces of wood: one stick of pine $\frac{3}{4}$ " thick, 3" wide and 45" long, and a very small piece of oak 1" by 1" by 2". In addition to the lumber get a spring about

5" long, push style, a round knob from a drawer, a quarter pound of escutcheon pins $1\frac{1}{4}$ " long of #18 wire, two dozen 1" wood screws of #6 wire, one brass rod 8" long and $\frac{1}{4}$ " in diameter threaded down $\frac{1}{2}$ " on each end, a nut to go over the thread, a couple of washers to go over the rod, one metal and one rubber, a steel sleeve or tube $3\frac{1}{2}$ " long for the brass rod to slide in, a strip of 1" brass $3\frac{1}{2}$ " long and thin enough to bend easily, and eight $\frac{3}{8}$ " brass round-headed screws.

That sounds like quite an order. Read the whole of this chapter before you buy anything. Later on I've suggested a wooden plunger assembly that you can make instead of the brass one. I've also suggested substituting wire brads for the more expensive brass pins. The list above is for the finest game but you may want to make a cheaper one for your first.

THE BOARD

Cut four $2\frac{1}{4}$ " strips from the 30" side of the plywood. This will leave you a piece of plywood 15" by 30". Cut it down to 15" by 27" and screw three pine battens to the underside of it. Put in the screws from the bottom so that they don't mar the playing surface of the board. Then cut the sides and ends from the $2\frac{1}{2}$ " plywood strips. Mitre the corners to fit snugly and neatly. Spread glue over the mitred corners and screw the sides and ends to the pine battens with the 1" screws. Now you will have a box-like affair that measures 15" by 27" inside. Sandpaper the floor and sides of the box, and then finish off the floor with steel-wool to make it perfectly smooth.



BAGATELLE

Use very light sandpaper, and sandpaper always with the grain for the best results.

Stain the whole thing now with some light oak oil stain and let it dry. Then screw on the brass strip as shown by the long curved line in the diagram. Use the little round-headed screws and set them about $\frac{1}{8}$ " from the top of the strip. At the bottom end of the left side put in two screws to hold it securely.

Then mount the spring. When you buy your spring get a fairly weak one. The best spring I ever found was a pull spring 2" long by $\frac{3}{8}$ " in diameter with thirty-two turns to the inch. I stretched it until it stayed 5" long and then it made a perfect push spring. Glue in the two oak blocks as in the diagram. They should be about $\frac{7}{8}$ " wide and just as high as the inside of the box. Then bore a $\frac{5}{16}$ " hole through the two oak blocks and the end piece so that the bottom of it is just $\frac{3}{16}$ " from the floor. Be careful to make it absolutely straight.

Glue in the metal sleeve as shown (a piece of gaspipe will do for this), slide the bar through the sleeve, put the rubber washer on as shown, and screw on the knob. Then put on the spring and the metal washer and screw the nut down tightly. That fancy rubber bumper in the picture is just the eraser from a pencil. There is nothing better. Leave the metal cylinder on when you take the rubber from the pencil, dig out all the wood, push in the three little bumps on the metal part, fill in the hole with glue, and screw it to the brass rod. If you wish you can solder it on and it will stay together forever.

Drive in two escutcheon pins almost flush with the end

of the bumper and $\frac{1}{2}$ " apart. These are stops for the balls and should center the ball directly on the center of the rubber bumper. Now try the spring with a couple of $\frac{1}{2}$ " glass marbles. If you prop the end of the box 2" from the table and pull the plunger one-third of the way back it should barely shoot the ball around the curved brass strip. If it goes around very fast the spring is too strong. If it won't go around at all the spring is too weak. You can strengthen the spring by pulling it out a bit. You can weaken it by cutting off a few loops.

Glue the side of the spring-box to the oak blocks and drive a couple of long brads through it into the floor, and a couple more into the blocks to hold it securely. Bore a $\frac{7}{8}$ " hole into the top of the spring-box (cut as shown in the diagram) about $\frac{3}{4}$ " above the upper end of the bumper. Then tack on the top with small brads. Make two legs $1\frac{5}{8}$ " high and about $\frac{7}{8}$ " square to screw into the batten at the top of the board. This is to give it an angle so that the balls will roll. But don't screw on the legs yet. Wait until you have driven in the pins.

Hunt up a piece of wrapping paper about the size of the box you have made and draw a full-sized diagram on it as sketched in the picture. Each little dot indicates an escutcheon pin. The pins in the circles and stalls are $\frac{3}{8}$ " apart. The "600" is a semicircle with a $\frac{5}{8}$ " radius. The others are shown in the diagram. Leave a $1\frac{1}{4}$ " opening on the "200," a $1\frac{1}{8}$ " opening on the "300" and the "400," and a 1" opening on the "1000." The little triangles in the circles are made of three pins, two $\frac{1}{2}$ " apart, and the center one halfway between them and $\frac{1}{4}$ " lower

down. When you are making the circles you will find that by driving an extra pin in at the opening, flush with the last one shown in the diagram, it will give them a finished look and make the openings just the right size. The "Double" is just a small quarter-circle of five nails $\frac{1}{4}$ " apart.

The pins that form the diamond-shaped obstacles are $1\frac{1}{4}$ " apart. The two pins at the extreme right of the board are $\frac{1}{4}$ " apart and the one next to the brass strip is $\frac{1}{4}$ " outside measure from the brass. It is very important that you get these in the right place. If they are further towards the board the balls will all bounce straight up and go into the "5," if they are too near the edge the balls will bounce horizontally and never go near the "200."

When the diagram is finished on paper set it in the board and drive in a few pins about $\frac{1}{4}$ " to hold it securely in place. Then, with a punch or a brad, prick through the paper into the wood to mark the pin locations. Pull up the paper and mark in the scoring numbers. Use India ink and a good wide lettering pen. Then drive in the other pins, each $\frac{1}{4}$ ". Be careful that they all stand up straight and the game looks neat and orderly. Screw on the two little legs and your Bagatelle is all ready to play.

PLAYING THE GAME

Set the board on a level table or the floor. Take seven balls, six alike and one of a different color or size. The best balls to use are $\frac{1}{2}$ " or $\frac{5}{8}$ " glass marbles or ball-bearings. The different ball, the seventh, is commonly called "Little Joe" or "Poor Susie" and counts double.

Shoot the balls one at a time. If you get a regular ball into the "Double" it doubles the entire score for the other six balls. If "Little Joe" goes in and stays it quadruples your score, or as a local wit once said it "Forbles" it! If a ball hooks on a triangle of pegs in one of the circles it counts for twice the value of the circle. If it gets in the "500" it will probably roll out and then won't count. That is one of the most pleasant things in this game. If you get "1000" you will probably be surprised. That hole is enchanted, but you can get in when you learn the trick. If the ball rolls back into the spring-box you get another try. But three trys with the same ball make you forfeit the ball.

It's a great game even with its many disappointments. Like life you will stick to it, not because it's fun, but because you want to see what's going to happen next.

BASEBALL BAGATELLE

If you are a baseball fiend, or a baseballophile, as a friend of mine would call a fan, you can easily turn the Bagatelle design into a baseball diamond. Build the board just as shown up to the point where you put in the escutcheon pins. Make the circles and obstacles just as you would for the other board. From here on is where the difference comes.

Make the triangles in the circles into semicircles measuring about 1" across. Now make seven stalls at the bottom instead of the eleven shown. Designate these: "Strike," "Ball," "Foul," "Fly," "Foul," "Ball," "Strike." Call the "1000" circle "Home," the "300" circle "Second

Base," the "400" circle "Third Base," and the "200" circle "First Base." The "Double" is now "Double Play" and counts as two outs against the fellow who is unlucky enough to get it. But don't mark the "Double" or the "1000" just yet. You may want to reverse their qualities. It is easier to get the "Double" than the "1000" if you are trying for it, but harder to get it by accident. So decide for yourself what you want to make them after you have played for a while. Make the "600" a "Fly" and the "500" an "Out."

If the ball goes into "First Base" it counts as a one base hit and should be left there. If the ball hangs up in the little semi-circle in the "First Base" circle it counts as one base stolen. So move on the ball that is there to "Second Base" and take the ball out of the semi-circle. If there are no men on base and the ball goes into the semi-circle consider it as a hit and leave it in the circle. Move all balls on every time you score, and tally those that make runs.

If there is already a ball on "Second Base" and one on "First Base" and you roll a steal it's just too bad. The man on first is out for trying to steal to second where there is already a player. But when you make a base hit all men move on according to the number you score. A "Homer" clears the bases.

If you roll a "Fly" the man at bat is out. If you get into "Out" the man nearest home goes back to the dugout. Each time the ball runs into the spring-box is a strike. Three strikes on a man are out. Four balls take a base and move on any man that happens to be on "First Base"

and all that he forces off. Play nine innings, three outs to an inning, each player shooting until he is retired. If more than two are playing you can divide into teams, each player shooting until he is out or on base. It's very exciting, and very like the real game.

CHAPTER XVI

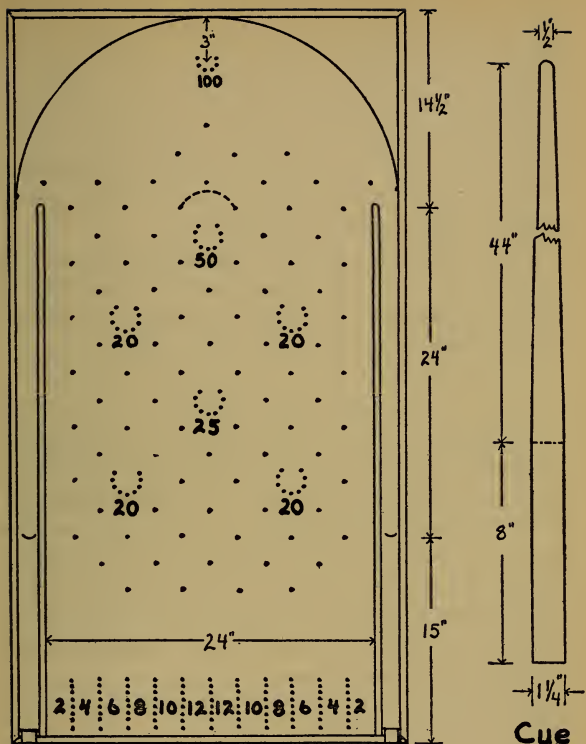
COCKAMAROO

THERE are so many Bagatelle games, all so different, all so interesting and full of suspense, it is a hard job picking the one that would be best. Even the names of the games have an appeal to them; La Bagatelle, Trou Madame, Sans Egal, and Mississippi. Which shall we make? I've chosen the oldest and best known, one not on the list above. Russian Bagatelle, or Cockamaroo, as it is often called, is the game. I must admit that I picked it first for the name—but I stayed with it for its qualities!

Cockamaroo requires more skill to play than the smaller modern Bagatelle games. It has the same element of chance, but luck is tempered with playing. And it is not at all hard to make. You will have plenty of chance to show your craftsmanship as well as your playing skill, and when your Cockamaroo is finished and ready for use you will find that young people and old, men and women, will all enjoy playing it.

MATERIALS

The simplest materials are the best. Get a piece of $\frac{1}{2}$ " or $\frac{3}{8}$ " fir plywood 30" wide and 4' 6" long. The thicker wood will be the best but many mills do not carry it. At the same time get two 5' pieces and two 5' 9" pieces of $\frac{1}{2}$ " by $2\frac{1}{2}$ " pine, and two 5' pieces of $\frac{3}{4}$ " by $3\frac{1}{2}$ " pine.



COCKAMAROO

The pine must measure as above when planed. You will also need two wooden poles $1\frac{1}{4}$ " in diameter and 52" long, or a piece of pine or spruce 2" thick, 3" wide and 52" long. Five dozen $1\frac{1}{4}$ " wood screws of about #6 wire, a half pound of $1\frac{1}{2}$ " brass escutcheon pins, half a dozen $\frac{3}{8}$ " round-headed brass screws, a few 2" finishing nails, a flexible strip of brass $1\frac{1}{4}$ " wide and 40" long, and a small pot of glue will complete the list.

If you want to face the board you will need about two yards of baize or other similar cloth 30" wide. This is not at all necessary but will help you make a more professional-looking and a more accurate game.

THE BOARD AND CUES

The board is made very like the modern spring-style Bagatelle, except, of course, on a larger scale. Cut your plywood to the size shown in the diagram, making it $27\frac{1}{2}$ " wide and $52\frac{1}{2}$ " long. On one side screw four battens made of the $\frac{3}{4}$ " pine. Put in the screws from the bottom so that they do not mar the surface of the plywood. Then, using the $\frac{1}{2}$ " pine, make a frame around the board as shown in the diagram. Glue the mitred corners securely, and screw the sides to the battens and plywood. On the top of the lower side of the box cut two small semi-circular notches as shown. Then put in the two fences or partitions. Make them of $\frac{1}{2}$ " pine, cut down to about $1\frac{1}{4}$ " in height to be level with the top of the box. Fasten them securely with glue and a few finishing nails or screws put in from underneath.

If you are going to cover the board with cloth you

should do it before you put in the two partitions. Cut the cloth to fit snugly over the entire floor of the box and glue it down with slightly watered warm fish-glue. If you aren't going to use cloth put in the partitions as described above and stain the box before you go to the next step. Use plain oil stain, any color you wish. Before putting it on sandpaper the floor and sides of the box.

When the stain is dry screw on the brass strip as shown by the large semi-circle at the top of the picture. Use the small brass screws for this job. Put them in about $\frac{1}{4}$ " down from the top of the strip. Set the ends of the strip slightly into the sides to make the joint smooth.

Now put in your pins as shown in the diagram. Each black dot is an escutcheon pin driven about $\frac{3}{8}$ " into the board. The circles are each 2" in diameter except for the "100" which is only $1\frac{1}{2}$ ". The stalls are each 2" wide. All pins in the stalls and circles are $\frac{3}{8}$ " apart. The other pins are set in parallel rows 2" apart. That is: the rows are 2" apart, the pins are 4" apart.

You will need some sort of stop in each of the alleys. The quarter circle shown 15" from the bottom-side is a bent escutcheon pin. Two straight pins driven in $\frac{3}{4}$ " apart inside measurement would be just as satisfactory and easier to make. These stops are to keep the balls from rolling all the way down the alleys.

The upper end of the board should be raised about 3". Make two small detachable legs and screw them on the top batten. Or fasten the legs on with small brass hinges to fold back when not in use.

The cues are very simple. You will need two of them.

Cut them out of the round poles or the piece of 2" by 3". The tapering begins 8" from the butt, as shown in the diagram. You can do it with a plane or a spokeshave. If you are making it from the rough wood cut it square to start, shave off the corners to make an octagon, shave off those corners to give it sixteen sides, and finish the rounding with #1½ sandpaper. Polish both cues with #1/0 sandpaper and stain or wax them.

PLAYING THE GAME

There are several games that you can play with this board. La Bagatelle is one of them, Cockamaroo is another. For La Bagatelle you will need nine balls. Small composition balls like those used in junior-sized billiard tables are the best. Large glass "aggies" about 1" in diameter will do just as well. One of the balls should be black, the others plain. The black ball counts double wherever it happens to go.

In La Bagatelle each player is allowed all nine balls. The black ball must be placed between the "100" and the upper pin in a small depression pressed just deeply enough into the wood to hold it in place. The black ball must be struck by one of the other balls if it is to count. The player can shoot from either alley, but must play all nine balls from the alley he chooses. Balls that fall into the opposite alley do not count. Every ball but the black one must be played from the stop towards the bottom of the alley.

Any number of people can play La Bagatelle. The game is won when a player reaches any previously de-

cided number of points, or when a given number of rounds has been played. This game is not exactly the same as the standard of the same name. I've changed the rules just slightly to make them fit another board. If you want to change them even more you may do so with a clear conscience.

Cockamaroo is often more interesting than La Bagatelle but it is limited to two players. However, if you have more than two people to entertain you can still play the game by teams, having a member of one team play a member of the other. You will need only two balls for this game.

1. String for the lead, or toss a coin. The player who gets the largest number or wins the toss can have his choice of balls and sides, and opens the play. He continues the lead until he fails to score.

2. The two players alternate, one playing his ball, then the other playing his from the opposite side of the board. The balls are recovered after each play and the score noted.

3. When a ball gets stuck on the board without going into a hole or a stall the two players alternately play with the ball that is left. If both balls are stuck on the board the game is continued with the last one. The player who knocks the stuck ball loose scores the number of points made by both balls.

4. If the ball goes around to the opponent's alley the player loses five points and the lead. If it returns into his own alley he loses two points and the lead.

5. Game should be set fairly low, say 150 or 250, so as

to give each player a chance to lead. The player winning game takes the lead in the next game. Set can consist of two out of three games, or three games out of five.

In the diagram for Cockamaroo I've drawn a dotted quarter-circle directly above the "50" hole. In the old games there was a small arch there with a bell hanging in it. Any ball that rang the bell counted for double. You can put up an arch and a bell, too, if you wish, or you can draw a line across between the two pins and make believe that it is an arch. The result in your score will be the same whatever you do—but the bell and arch will be a little more romantic-looking.

CHAPTER XVII

GAME BOARDS AND COUNTERS

MANY indoor games, especially table games, require special boards and counters. These boards may be anything from a piece of oilcloth to wood inlay, and the counters may be slices cut from an old broom-stick or intricately carved mahogany chessmen. The material depends entirely on the size of your pocketbook and your ambition. There's a board for every purse, as it were, and a board for every desire. Although the material may vary, the boards described in the following chapters can all be built exactly alike except for the design painted on their faces, or for the number of counters used.

So instead of completely explaining each kind of board under each game I'm going to give the construction details here. To use these suggestions first decide what type of board you want to make, then look up the materials required and the dimensions under the game you are building, and set to work as outlined below.

You can make some very neat pieces by putting two designs on a board, one on each side. For instance, Backgammon seems to fit naturally on the back of the Checkboard; Four-handed Checkers will go on the opposite side of Five-in-a-Row; the two Halma games can share the same board; and Fortyniner will fit nicely on the back of Nine Men's Morris. If you make these four sets

you can play all the games here. Of course, you don't have to use the backs of the boards, and if you have plenty of time and plenty of room to store the boards it might be better to make a different one for each game. Then when the Checkerboard is in use you can still play Backgammon.

There are two styles of boards where the back can not be used. In the bridge-table-cover board painting the design on the back is difficult and it does not look neat. In the peg-style boards the peg holes would tend to conflict. But the other two types of boards that I suggest, the wall-board and plywood styles, are naturally fitted for double work and where storage space is limited you can keep all the games in half the room.

Some of the counters, too, will serve for two or more games. The Checkers, for instance, can be used for Nine Men's Morris and Backgammon, and the men for Four-handed Checkers can be used in Halma and Five-in-a-Row. Pieces like Chessmen that are limited to one game, and the number, color, and dimensions of the men for all the other games, are described under the chapter of the game itself. I'm giving only the construction of the general counters below.

Before you start on any of these games run through this chapter and pick the style of board that you want: then go to it.

PLYWOOD BOARDS

The plywood boards are the easiest to make and the most substantial of those given here. The suggested dimensions need not be followed but you will probably find

that they are the most satisfactory for the particular game. I've recommended $\frac{3}{8}$ " three-ply western fir veneer-wood for most of the games. It's good strong wood, easy to work, has an interesting grain, and is reasonably priced. For some boards you may prefer some other kind of plywood; but that's entirely up to you.

Be careful to cut the board square and to the exact size that you want it. Then sandpaper it all over, round the edges slightly, and round off the corners. This makes the board neat-looking and more substantial than if the corners were left absolutely square.

You can stain or paint the board, whichever you like. For Nine Men's Morris a dark stain and a red design is very handsome, for Five-in-a-Row and Halma a light stain and black lines will probably be the best. But for any of the checkerboards black and red is the most conventional and the best looking. Lacquer is a good color to use, but you can not put it on over oil stain and it is expensive. Good grade enamel is reasonably priced and will produce a very neat job for the background of a board. But enamel is no good for the design. It is too transparent and runs too freely. Use artists' color mixed with a little linseed oil and turpentine.

You will have to be very careful when painting any of the checker designs. First paint the whole board black or red, rub it down when dry and put on a second coat. Then carefully line up the squares using a very hard pencil with a sharp fine point or a sharp darning needle. Paint in the other squares and trim the edges. Put on a second coat, rub it carefully with fine steel-wool, and

varnish the whole board. The varnish is not absolutely necessary but will make the board last much longer and will help cover up any slight imperfections in your painting job. If you use lacquer don't try to varnish over it. Finish the board off with clear lacquer instead.

There are two other ways to put on the design but I'd suggest that you experiment a bit with both before you use them. If done improperly one will blotch and the other will fall apart. But when done right they will both give a very professional-looking job.

The first is the easiest. Paint the board black or whatever color you want, putting on two coats and rubbing them both down slightly. Then, using colored paper, cut out the design and glue it to the board. If you are making a checkerboard just cut out the required number of squares and glue them in place. If you are making the Nine Men's Morris cut out the strips and circles and glue them on. Use a high-grade fish-glue slightly watered and heated to give it fluidity. Spread the glue all over the bottom surface of the paper and press it firmly on the board. When the glue is dry give the whole board two coats of varnish. If glued properly this board will be very substantial. But if carelessly done it will soon begin to peel.

The second alternative board also requires a paper design. Enamel the whole board the color you want the design. Put on two coats and rub them both a bit. Then cut the design from heavy paper, wax one side with paraffin and cover the other side with rubber cement or the adhesive called "Grippit." Cement the design firmly on

the board and let it dry for a while. Then paint the board with the background color carefully avoiding the paper design. When the second coat has dried pull the paper design off and throw it away. Rub off any rubber cement that's left on the board, touch up any places that need it, and varnish the board. The paper was used as a stencil to help guide your hand. It was glued on with rubber cement to hold it firmly while you were working on it, and to let it go easily when you were through with it. Other kinds of glue will not do this. They will hold the paper firmly forever.

A few of the games do not require any color in the designs. Nine Men's Morris is one of these, Halma and Five-in-a-Row are others. You can make very simple boards for them with very little trouble. Stain your plywood board with light oak oil stain and after you have let it soak in for about a minute rub off as much stain as possible with a dry cloth. Let it set for about four hours. Then draw on the design using black India ink and a wide lettering pen. It will give a very interesting effect, and you will be surprised at how easy it was to do.

WALL-BOARD BOARDS

The wall-board games are the cheapest to make and are usually rugged enough to stand up for quite a while. Use a good-grade, hard-faced wall-board from 3/16" to 3/8" thick. Cut the corners round with a sharp jack-knife and smooth the edges either with a razor blade, or with #2/0 sandpaper. If you use sandpaper rub the edges only

one way. It will do a surprisingly nice job, but if you rub it two ways the finish will be fuzzy.

There are several ways to paint the design on the wall-board boards. Use any of those described under plywood boards. The paper-design suggestion will be especially good here, and if you give the board two coats of varnish it will be very substantial. There is one additional way to paint these boards that I prefer because it is the simplest and the easiest for most people to do. That is to use water-proof colored ink.

The ink won't go on wood very well unless the wood is first primed. That's one of the reasons why I suggested that you stain the last of the plywood boards. But ink will go on wall-board very nicely. Most colored water-proof inks are transparent. You can make them opaque by adding white waterproof ink to them. Black India ink will be opaque enough as it comes so don't add white to it.

Paint on the background color if you wish or just leave it plain, and put in the design either with a brush or a lettering pen. The pen is the best because it is the easiest to control and you can guide it with a straightedge. Use a #3 or a #4 pen. Don't dip it in the ink. Most India ink bottles have a little quill on the stopper to use in filling the pen. If you varnish a board done in ink it will brighten up the color and make it last much longer.

FOLDING BOARDS

Folding boards can be made either with thin plywood or beaver-board, the latter generally being the better. In

addition to the square of beaver-board you will need two pieces of fairly good quality cotton or linen cloth of fine hard weave. One piece should be about four inches larger than the board, the other piece about the same size.

Wash the cloth in cold water and iron it dry. Cut the board in half with a sharp knife. On one side of each half spread a thin but even film of high-grade fish-glue. Spread out the larger piece of cloth and paint glue over one side of it. Set the two half-boards glue-side down on the cloth leaving an overlap of cloth on all sides and about $\frac{1}{8}$ " space between the board halves. Trim the cloth edges slightly to fold over about 1" on the top side of the boards. Spread a little glue on the boards and fold in the edges of the cloth making the corners neat and flat.

Turn the glued side up and roll the cloth firmly with an old rolling pin, a film roller, or a bottle to take out all the wrinkles and give the cloth a good bond on the board. Then turn it back again and glue the other piece of cloth to the free side. Trim the edges so that they come about $\frac{3}{16}$ " from the edge of the board and overlap the turned-in sides of the other piece of cloth. Roll that side, too. Set the board down flat, put a weight or other pressure on it, and leave it to dry.

It should dry overnight with the weight on it and several more hours with the weight off. Then you can paint it according to your desires. Paint will generally run in the cloth so it will be best to size it before you put on the design. The background coat will do the trick. Look up the directions under plywood boards for suggestions on how to paint the design. Be sure to finish off the board

with a coat or two of varnish. You can use either side for the playing board. But you will probably find that the side made with the smaller piece of cloth will be the best. Fold the board with the design inside.

TABLE-COVER BOARDS

You can make very neat bridge table covers with the boards painted on them. Use either light-weight fine-surfaced duck or plain-colored high-grade oilcloth. Get a piece about 30" square and hem the edges to keep it from unraveling. Put tie strings on the corners.

Now paint on the diagram. If you are using canvas or plain cloth it will be necessary to size it before painting. Just use one coat of whatever color you want and put it on with a brush. It is best to paint the design on these boards because the glued paper designs will tend to crack up or fall off whenever the cover is rolled up to put away. If you make one or more of these table covers get a 30" dowel about 1¼" in diameter to roll the cover around when you put it away.

BOX BOARDS

In the chapter on Checkers and Backgammon I've shown a drawing of a box-style board. The nice thing about these boards is that you can keep your counters inside when the game is not in use, but unfortunately the box is seldom rugged enough to stand up under any maltreatment. It is also likely to take up too much room. So I'd suggest that if you make one, build it for Checkers and Backgammon, or Nine Men's Morris and Fortyniner

where you can keep the size down to something reasonable.

You will need a piece of $\frac{1}{4}$ " plywood the size of your board, and another piece the same thickness, $1\frac{1}{4}$ " wide and six times as long as the side of the board. Saw the square plywood in half and make two boxes using the $1\frac{1}{4}$ " material as sides. Follow the diagram closely so as to make the center section as shown. The sides do not overlap the bottom in the inner sides of the two sections but do overlap on the outside. Mitre all corners and joints, glue the pieces together and fasten more securely with small wire brads about 1" long. Use small brass hinges to join the boxes, and fix a brass latch to keep the box closed.

For miniature editions these box boards are very nice. In the chapter on Chessmen I've described one in detail. You can use the same board for Checkers, and you can paint the Backgammon design on the outside of it.

PEG-BOARDS

The peg-board is the best of all boards for games requiring many counters. The Halma games, Fortyniner, Four-handed Checkers, and Five-in-a-Row are all easier to play on a peg-board. If you should be jostled in the middle of a game the men will not be shaken out of place.

Use hardwood $\frac{1}{2}$ " to $\frac{3}{4}$ " thick for all peg-boards. Plywood will do if you have an unusually sharp bit, but in my experience I've found that the surface ply tends to split rather easily either when the board is being made

or later when the game is being played. If you get heavy, high-grade veneer-wood you shouldn't have too much trouble. But the hardwood will still be the best.

If you are making the board of plain lumber you will have to build a frame around it. Under Checkers I've described a board that would be a good model. It is trimmed with $\frac{3}{4}$ " by $\frac{3}{4}$ " wood mitred at the joints. The trim is screwed securely onto the edges of the board. You will need more strength than this gives in the larger boards so join the separate planks with dowels and glue. Also use plenty of glue when putting on the frame.

Before you sandpaper the board put in the peg holes. The diameter of the holes is determined by the kind of peg you plan using. Later in this chapter I've described several for you. Take your choice. $\frac{3}{8}$ " to $\frac{1}{2}$ " is deep enough for the holes. You can make a guide that will keep you from going any deeper. Drill a hole lengthwise through a piece of $\frac{3}{4}$ " dowel. Then saw the dowel so that it will slip over the bit leaving $\frac{1}{2}$ " of the cutting end sticking out. When you are boring the holes the guide will stop the bit at $\frac{1}{2}$ " even if you should fall asleep or forget.

When all the holes are finished sandpaper the board thoroughly. Be careful when painting on the background or design that you don't fill up the holes with paint. It is a very easy thing to do because the hole-edges tend to take more than their share from the brush.

In several of the games the holes themselves provide all the design that you will need. Halma, Five-in-a-Row and Nine Men's Morris are a few of these. In the other

games the holes can be used as part of the design and will simplify the painting job a great deal.

COUNTERS

The variety in counters is not at all as large as the variety in boards. For most of these games there are only two kinds of counters, and two ways of making each of them. Of course Chess requires specialized men, so I've left them to be described fully under the chapter on Chess. But suggestions for making the rest of the counters will be given below.

The checker-style counter is the one generally used. They are usually made of dowel wood which is already round and needs only sawing into slices, smoothing with sandpaper, and painting. Get the quantity and size dowel suggested under the game you are making. Cut this into disks according to the dimensions given and finish up with sandpaper and paint. It hardly needs any further description, but there are a few "tricks of the trade" that will help you.

You can make a guide that will hold your dowel while you are sawing it and will make all the disks uniform. If you have a mitre box you can use it as part of the guide, but if that tool is not a part of your equipment it is easy enough to make one. Nail two 12" lengths of 1" by 5" wood (any kind) to the 2" sides of a 12" piece of 2" by 4". About 4" from one end set your try-square across the open top of the 1" side-pieces and mark a line. Then, still using the square, draw a line down each side of the 1" side-pieces. With a back-saw make a cut down these

lines to the 2" by 4". That will give you a box-like affair with both ends open and a saw-cut at right angles to its length, in short, a mitre box.

Now make the gauge or guide. Take a piece of 1" by 4" by 2" wood and set it inside the box towards the end with the saw-cut. Fasten it down with a "C" clamp, putting the block's inside edge the distance from the saw-cut in the mitre box that you want to make the thickness of your men. To cut out the counters put the dowel inside the box, shove it up against the guide piece and, holding it firmly with your left hand, cut off a slice with the saw in the mitre-cut. Take out each disk as you saw it and push the dowel up against the guide again. In this way you can cut as many pieces as you want without having to measure each one. They will be of uniform thickness, and if the box is true, the sides will be square with the faces.

Sawing out the men is the easiest part. Coloring them is where you might run into trouble. Using waterproof ink is the easiest way to color the men because the ink will dry rapidly and you can put it on with a paint brush or by dipping the counters into the bottle. Painting the men will make a neater job, but unfortunately will be more trouble.

The best way I've found is to impale each counter on a common pin. Then, holding the pin, you can paint the counters with a brush and hang them up to dry. Two coats will generally be necessary for a good-looking job. When the second coat is dry you can paint over the spot where the pin was.

Lacquer is the best paint for these counters. But I've found that ordinary enamel is much more reasonable in price and will do a remarkably handsome job. A small ten-cent can of enamel will be enough for a set.

PEG COUNTERS

It will take you forever to make as good pegs as you can buy. Ordinary wooden golf "Tees" make the finest of pegs. They come in several colors, are reasonably priced, and seem to be made for just this purpose. But, if you wish, you can cut your pegs from plain dowel wood, using the easy method described below. They won't be quite as good as the golf tee pegs but you will probably like them better because you made them yourself.

In the following chapters I've suggested that you use $\frac{3}{8}$ " dowel for all pegs and that you make them each $1\frac{1}{4}$ " long. I chose that size because it is the easiest to handle. Sandpaper the dowel before you saw it up, and when you have all the little sticks cut out round off the ends with more sandpaper. You can cut a slot in the bottom of each peg if you wish. It makes the men a little easier to work but is not really necessary except for the checker games.

Don't paint the pegs. If you do you will run into trouble when the time comes to play the game. Use waterproof ink instead. Dip the men into the ink once or twice depending on the intensity of color you desire. Don't varnish them either. Just leave them as they are, colored by the ink.

A BOX FOR THE MEN

Very probably you will want to make a box to keep the pegs or counters in. I haven't made a drawing for the box because the size of it depends entirely on the number and size of the men you make. Below I'll give you a few suggestions on construction, and how to determine the dimensions.

Use $\frac{1}{4}$ " or $\frac{3}{8}$ " good grade pine or plywood. Find the dimensions by stacking the counters in a rectangular pile like cordwood. Measure the height, length and breadth, and use those dimensions for the inside of the box. Glue all joints and tack together with small wire brads. The top can be hinged on. Or, if you make the sides sufficiently high you can put on a sliding cover.

For such games as Four-handed Checkers and Forty-niner partitions will help you keep the counters straight. Use $\frac{1}{8}$ " material for the partitions, set them into grooves in the side of the box. To get the right length for a partitioned box you will have to add the total thicknesses of all the partitions to the length of the stack of counters.

Sandpaper the box to make it look nice. Paint it to match your set, or color it with oil stain. If you use oil stain let the stain set for a minute or two and then wipe off all excess with a soft cloth. It will bring out the grain of your wood and give it a very handsome effect.

CHAPTER XVIII

CHECKERS AND BACKGAMMON

PROBABLY you already have a Checker and Backgammon outfit around the house. Most people do whether they play the games or not because Checkers and Backgammon have long been considered standard pieces of furniture like book-ends and door-stops, things to have around for the time when they might be useful. But possibly you have neither game, or you may be tired of looking at the old battered relic which you have tried so often to hide behind the book-case. You may want to make a new set.

So here I'll tell you how to build these games, the men and the boards. They are good games to start with because they are the easiest and simplest of all the table games. They are interesting games to play, too, but I won't try to give you the rules here. To do them justice would fill a whole book, and probably you already know the rudiments.

THE CHECKERBOARD

You can make your checkerboard in a variety of ways. Pick your style from the group given in the chapter on Game Boards, or, if you prefer, make one of the two simple ones described below.

The first is a regular-sized board 13" square, made of a 12" square piece of $\frac{1}{2}$ " pine trimmed with a little frame of $\frac{1}{2}$ " by $\frac{1}{2}$ " pine. In addition to the wood you will

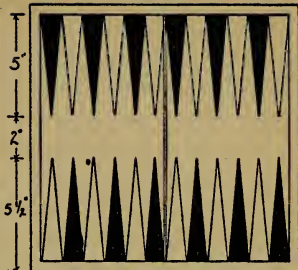
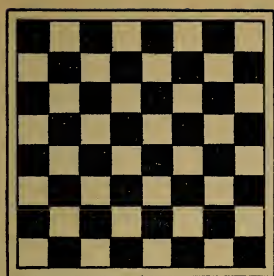
need a few $1\frac{1}{2}$ " finishing nails, some glue, a small can of black and a small can of red paint, and a 12" piece of 1" dowel.

Mark off the 12" square board as shown in the drawing, making each of the sixty-four squares $1\frac{1}{2}$ " on the side. If you have a good sharp saw make a cut about $1/16$ " deep down each line. When the board is finished it will give the effect of raised squares. Now cut the trim to the proper size with the corners mitred to fit snugly. Glue and tack them on the square piece of wood, plug the holes with a little plastic wood, then sandpaper the whole affair, rounding off the edges slightly, making it nice and smooth.

Paint the squares black as shown in the diagram and paint the white ones red. Plain enamel will be good for this job because the division cuts will keep it from running too far. Give the board two coats of enamel, rubbing it slightly each time with a little fine steel-wool. When the last coat is dry give it a once-over with varnish.

If you wish you can cut this board through the middle and fasten it together with small brass hinges. If you make a folding board be careful to cut it in the right place. Saw it so that a black square will be to your extreme left when playing the game. It will make a neat board that will fold compactly when you want to put it away.

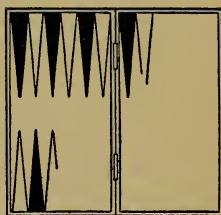
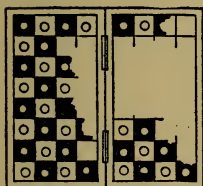
I suggested above that you buy a little dowel wood. This is for the checkers. You will need twelve red and twelve black ones. Make them each about $7/16$ " thick and cut them out as described on page 179.



* $1\frac{1}{2}$ * $1\frac{1}{2}$ * $1\frac{1}{2}$ * $6\frac{1}{2}$ "

$6\frac{1}{2}$ " * 1 * 1 * 1 * 1 * 1 * 1 *

CHECKER BOARD BACKGAMMON



3 " $3\frac{1}{2}$ "

3
opposite
4

$6\frac{1}{2}$ " 6 "



POCKET CHESS DICE FOLDING BOARD

The second board is a miniature one. Make it of $\frac{1}{2}$ " wood, too, preferably hardwood, and cut in two all the other dimensions given above. Construct the board just like the big one, even to the hinges, if you wish, and make the checkers from $\frac{1}{2}$ " dowel, cutting them each $\frac{3}{8}$ " thick. You can improve on this by using golf "tees" as checkers and boring small holes in the center of the squares as suggested under peg-boards on page 177. If the board is hinged it makes an excellent little game to carry around in your pocket. You can play it in your odd moments with any other Checker enthusiast who happens to be around.

BACKGAMMON

While you are making your checkerboard you might as well put your Backgammon on the other side. Find the middle of the board (or use the split if it's a folding board) and mark two black lines about $\frac{1}{8}$ " on each side. Later fill in between these lines to divide your board into "tables." Then, on each side of the center line, divide the board into six equal parts. They will each be the slightest trifle under 1", or, to be exact, $47/48$ ". Divide each of these parts in half and draw very faint lines across the board. These are to help you center the spearheads when you mark them out.

Now make the points as shown in the diagram. They are each 5" high. Paint them as shown, half black and half red, and when the paint is dry varnish the entire board. Don't try to paint one side of the board while the other is still wet. You might smudge it.

The counters for Backgammon are the same as those

for Checkers. You will need fifteen red and fifteen black. Make them from 1" dowel as described above. You can use the little golf "tee" counters for a small peg-board. But don't put the peg-checkerboard on the back side of a peg-backgammon-board. The peg-holes will probably conflict and the board will be spoiled.

I've drawn some dice for you to use with the Backgammon. They are just cubes about $\frac{3}{4}$ " square with numbers or dots painted on the six sides. Be sure that you get the numbers on right. There is only one way to mark dice and that is as shown in the picture. The 6 is opposite the 1; the 3 opposite the 4; and the 5 is opposite the 2. If you place the block on the table with the 1 facing you and the 2 on top, the 3 will be on the left, the 4 on the right, the 6 in back and the 5 on the bottom. Easy!

Make each die absolutely true before you paint on the numbers, and sandpaper the faces and edges to make it ever so slightly rounded. Use either maple or other close-grained fairly heavy wood. If the dots remind you too much of the old African game and you'd like to forget it paint numbers on the dice instead of the dots. It is easier to count up to six if it is a "6," anyway, than to count up six little black spots.

CHAPTER XIX

CHESSMEN

IN one respect, I must admit, these chessmen are not practical. You can buy a very handsome outfit, men and board, for only one dollar and forty-nine cents. And to whittle these men will probably take you a full week's work. Not at all economical, not at all in line with the times, but a lot more fun! At least that's the way I've found it, for there is a kind of solid satisfaction and a feeling of personal creation in whittling that is seldom found in any other activity.

Here I've given you three designs for chessmen. One is intended for whittling, one for making on a lathe, and the third is a miniature game. Actually you can turn all three on a lathe, or whittle all three, but if you make them in the manner for which they were designed you will probably have better luck. Not one of them is as hard to make as it looks but I've added a fourth set that you can whittle in a hurry. If you make it you can learn how to play the game, and while you are waiting for your opponent's next move you can whittle out a really fine set.

THE EASY SET

Use plain dowel wood for your first set. It is surprisingly easy to carve, and it's hardy. If your knife slips you won't do much damage. Buy a stick $\frac{5}{8}$ " in diameter and



$\frac{3}{8}$ "
 $\frac{1}{4}$ "
 $\frac{3}{16}$ "
 $\frac{1}{2}$ "
 $\frac{5}{16}$ "



Pawn



$\frac{1}{4}$ "
 $\frac{3}{16}$ "
 $\frac{1}{2}$ "
 $\frac{1}{2}$ "
 $\frac{1}{4}$ "



Castle



$\frac{3}{8}$ "
 $\frac{1}{4}$ "
 $\frac{3}{8}$ "
 $\frac{1}{2}$ "
 $\frac{1}{4}$ "
 $\frac{1}{4}$ "



Bishop



$\frac{3}{16}$ "
 $\frac{5}{8}$ "
 $\frac{1}{2}$ "



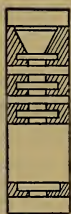
Knight



$\frac{3}{8}$ "
 $\frac{3}{8}$ "
 $\frac{3}{8}$ "
 $\frac{11}{16}$ "
 $\frac{11}{16}$ "
 $\frac{1}{4}$ "
 $\frac{3}{8}$ "



Queen



$\frac{3}{16}$ "
 $\frac{3}{8}$ "
 $\frac{1}{8}$ "
 $\frac{11}{16}$ "
 $\frac{1}{4}$ "
 $\frac{3}{8}$ "



King

CHESSMEN



$\frac{7}{8}$ "
 $\frac{1}{8}$ "
 $\frac{1}{2}$ "
 $\frac{3}{16}$ "

Pawn Castle Bishop Knight Queen King

POCKET CHESS

about 6' long, and saw it into the following sized pieces: sixteen $1\frac{1}{2}$ ", four $1\frac{3}{4}$ ", four 2", four $2\frac{1}{2}$ ", and four $1\frac{1}{4}$ ".

Carve little knobs out of the tops of the $1\frac{1}{2}$ " pieces and round off the shoulders under the knobs. These are Pawns. They will look something like the regular ones shown, minus the frill. If you wish you can round off the body and put on the little pedestal. Sandpaper the sixteen pawns and paint eight of them black.

Now make the four $1\frac{3}{4}$ " pieces into castles. Just make cross-cuts in the top $\frac{1}{8}$ " deep. You can round off their bodies, too, if you wish, and make the pedestal. It will improve them and won't be hard to do.

The four bishops are made of the 2" pieces. Carve a knob in the top as you did for the pawns. Now about $\frac{3}{4}$ " from the top make a saw-cut $\frac{1}{4}$ " deep running clear around the man, and about $\frac{1}{8}$ " above that make another saw-cut. Cut out the neck, round off the body, sandpaper the man smooth, and you will have a quite respectable-looking bishop with one frill around his neck.

The queen is made in the same way as the bishop with the knob and the frill, very much like the miniature queen but taller and more stately and slim. And for the king, just copy the miniature one using the $2\frac{1}{2}$ " sticks and doubling all dimensions above the neck.

By this time you will be an expert whittler and making the knight will be easy. Whittle out a head like the miniature horse's head. Leave a $\frac{3}{8}$ " projection or tail on the bottom of his neck. If you'd rather you can cut the head from $\frac{1}{4}$ " wood with a coping-saw but it won't be quite

as interesting. Round off the top end of the four $1\frac{1}{4}$ " sticks, bore a $\frac{1}{4}$ " hole $\frac{3}{8}$ " deep in the top of each, glue the horses' necks into the holes, and sit back to admire your job. You will have a real horse's head on a nice solid-looking pedestal, modernistic to the last degree.

Be sure that your knife is good and sharp before you go to work. Make all the saw-cuts for the frills before you do any carving. Sandpaper all the men carefully before you paint or varnish them. You will need two sets, one black the other plain or red. Each set will consist of eight pawns, two castles, two knights, two bishops, one queen, and one king. Any one of the checkerboards will do for these men. The first one suggested is just the right size.

THE WHITTLED SET

If you have made the easy set you shouldn't have any trouble whittling the men I've shown in the picture. They are a little more complicated and delicate, but much more fun. You will need a good sharp knife, a fingernail-file, and some #0 sandpaper for tools, and a few sticks of dowel for materials. If you whittle the men entirely and refuse to use a saw except when cutting out the blocks you will be more proud of the finished job. And in all probability, after you have made a few men you will be very much surprised at how well they are turning out.

Just as an experiment I whittled a few men from a piece of plain dowel, using an ordinary big-bladed Scout knife. I was surprised, very much so, for I'd never tried anything so delicate with such a large and awkward

blade. But the pictures I've drawn for you are taken directly from the models I made in that way. I wouldn't do it again, though, nor would I suggest that you try it with the same kind of knife. Get a smaller knife, one with a fairly large and comfortable handle and two blades. You can use the larger blade for roughing, the smaller for the finer work.

The fingernail-file will help you in smoothing up the finished men. To smooth them still further, and to get a nicer texture you can use sandpaper. Wrap a small piece of it around the file and sand slowly and carefully, constantly turning the man in your hand. Of course, you should whittle slowly, too. Take off small chips, being careful not to cut too deeply.

When the men are all cut out you can color them red and black. Two coats of enamel will give them a smooth and interesting finish. They look very handsome and graceful lined up on a red and black board.

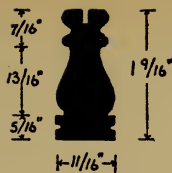
THE TURNED SET

You can make a super-fine set of chessmen very nicely if you have a lathe. And if you have a lathe you will know how to work it so I won't have to tell you here. Use box-wood and ebony, or maple and mahogany, or just plain maple for the men. If you make them of colored wood finish them plain. If you use maple alone enamel half of them red and half black.

The de luxe pawns are $\frac{5}{8}$ " in diameter. The castle and bishop are also $\frac{5}{8}$ " in diameter, but the rest of the men are made of $\frac{3}{4}$ " wood. You can cut the knight from one



Pawn



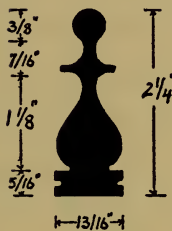
Castle



Bishop



Knight



Queen



King

CHESSMEN TO WHITTLE

solid piece of wood or make his head and body separate and glue them together.

If you aren't lucky enough to have a lathe you can still make these fancy men and have a great deal of fun carving them out. Buy a couple of dowel sticks, sharpen your knife and saw, and go to work. I once started to make a set from an old broom handle just to see how they would look. They looked all right but I never finished the set. Never in my life have I seen such tough wood to carve! You would do well to profit by my sad experience. Get dowels and forget about broom handles being cheap.

Make the pawns first for practice. After cutting the blocks of wood to the proper length set them one at a time in the mitre-box and make a saw-cut all around about $\frac{1}{4}$ " deep and $\frac{3}{8}$ " from the top. Make a similar cut $\frac{1}{4}$ " below that, and a final cut about $\frac{1}{8}$ " deep and $\frac{3}{16}$ " from the bottom. Look at the rough sketch of the pawn and you will get the idea.

Now round off the block of wood with your jack-knife so it looks like the left-hand sketch of the pawn. Smooth it up with a fingernail-file and #0 sandpaper as suggested for the whittled set. If done carefully they will look every bit as good as a lathe-turned set and will have the added character of carved work.

After you have made a pawn or two you will be able to sail right along, and when you have all sixteen finished you will be an expert at it. You can follow the diagrams for the rest of the men so I won't go into detail about them. Cut them all out in the rough first if you wish and finish them up later. As I suggested once before you can

trim off the men you have captured while your opponent is deciding whether to take your castle or just to check-mate you. It will annoy him and you'll win the game.

I gave the king one more frill than the queen. In the days when Chess first came in the kings were gay dogs who went out and did things while their wives stayed at home and spun. You may give the queen a spare frill, too, if she seems too prim and simple for you, or if you think I've got the wrong idea on modern queens. Or you can combine this set with the easier whittled set, simplify it a little if you wish, and make an outfit that is all your own.

AN INLAID BOARD

Some day, especially if you have made a complete set of chessmen and are very proud of it, you will want an inlaid board to match. To make a really handsome one get a piece of maple $6\frac{1}{2}$ " by 13" by $\frac{1}{4}$ " thick, and a piece of mahogany the same size. Also get a 12" square of $\frac{1}{4}$ " plywood and about 60" of $\frac{1}{2}$ " by $\frac{1}{2}$ " maple.

Cut the maple and mahogany into thirty-two $1\frac{1}{2}$ " squares and glue them to the plywood base. Cut and mitre the $\frac{1}{2}$ " by $\frac{1}{2}$ " maple to make a frame for the board. Glue and nail it on with wire brads running into the plywood. Leave the board to dry for a couple of days under pressure, then sandpaper and varnish it.

It is not at all difficult to make, and when done properly it is quite beautiful. You can make inlaid boards for all the other table games if you wish but I haven't suggested it because it would be too complicated for most amateur craftsmen. But when you finish this one you may

want to go ahead on something harder. Whether you succeed or not the doing of it will be worth it.

MINIATURE CHESS

There are a lot of people who like to carry chessmen around with them and play the game in their odd moments. Odd moments, indeed! For practically every chess player I've ever met required a good many odd moments for only one move to say nothing of a whole game! But it's fun just the same, even if you have only time to take out the board and set up the men and decide who is to open.

Carve the chessmen from $\frac{3}{8}$ " dowel, except for the pawns which are made of $\frac{1}{4}$ " wood. Follow the pictures and you will have little trouble. The tails on the bottom of the counters are to set in holes in the board to keep the men from being knocked around.

The board is simple, too. It is made of $\frac{1}{4}$ " maple. The squares are each $\frac{3}{4}$ " wide and a $\frac{3}{16}$ " hole is bored about $\frac{3}{16}$ " deep in the middle of each square. Make the sides of the box about $\frac{5}{8}$ " high so that you can close it up with the men inside. Use small brass hinges, and a little brass clasp. When the board is folded up it will be just about the size of a pocket edition book.

CHAPTER XX

FOUR-HANDED CHECKERS

CHECKERS has been played for so many centuries it is almost impossible to trace back even near the origin of the game. But the two-handed game has always been a rather exclusive pastime, a fine game for two players—and two watchers, but hardly versatile enough to accommodate more. So, probably having this in mind, some clever fellow made up a four-handed game.

Four-handed Checkers has become very popular in the past few years, mostly, I'd say, because it takes ingenuity, strategy, and cooperation rare to most four-handed games. For some reason or other the game itself has not yet become codified. Several different board designs have been developed and as many sets of rules have been worked out. For the design here I'm indebted to Mr. V. K. Brown of the South Park Commissioners in Chicago. His board has been very popular with a good many players, and in my own experience I've found that it gives unusual opportunities for real cooperative strategy.

THE BOARD AND COUNTERS

Before you buy your materials decide upon the kind of board that you will make. The chapter on Game Boards contains descriptions of many varieties. Pick the one you like best from there. Probably you will prefer

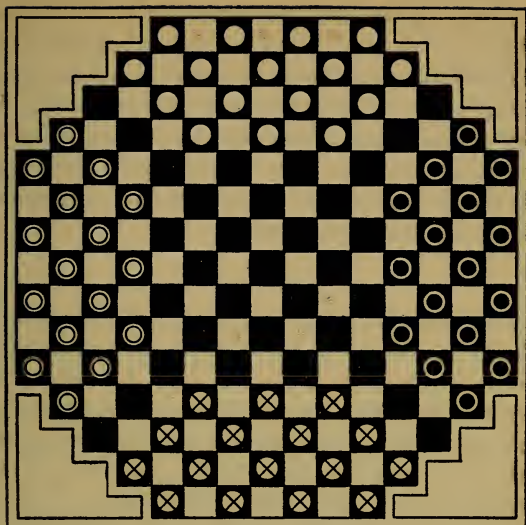
either the plywood board or the peg-board. They are both very popular.

The plywood board is made of $\frac{3}{8}$ " veneer-wood $23\frac{1}{2}$ " square, and the checkers for it from a round piece of curtain pole $1\frac{1}{4}$ " in diameter and 24" long. Construct your board according to the directions given on page 170. Paint the diagram as shown in the picture. Don't put in those circles and things that I've shown. They are supposed to represent checkers.

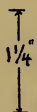
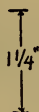
You will need four different kinds of checkers each $7/16$ " thick. Suggestions for making the counters are given on page 179. When you have carefully sanded the sixty-four necessary pieces paint half of them black and half red. When the paint has dried mark a black cross on sixteen of the red checkers and a red cross on half of the black. That's all.

The peg-board can be made a little smaller. Make it from a 17" square of $\frac{3}{8}$ " or $\frac{3}{4}$ " hardwood, or $\frac{3}{8}$ " plywood. Follow the directions given under Game Boards. Put the holes in the exact center of each black square before you paint the board. If you are going to paint on red squares too do them first.

Saw the $\frac{3}{8}$ " dowel into sticks $1\frac{1}{4}$ " long. Cut a little nick with a saw in the bottom of each one and then sandpaper them all, rounding off the ends slightly. Color thirty-two of them black with India ink and paint a red band around the middle of half of them. The other thirty-two pegs should be left plain or stained with red water-proof ink and a black band should be painted around sixteen of them.



The Board



Checker

Peg

FOUR-HANDED CHECKERS

You won't be able to use wooden golf "tees" instead of pegs in this game. When you make a king you can't pile the pegs on top of each other as you can with regular checkers. But you must have some way of showing the peg's elevated rank. That's what the saw-cut is for on the bottom of them. Turn the pegs upside down with the saw-cut showing and you will not have to remember which pegs have been promoted.

THE RULES

Four-handed Checkers is always played with partners. You can decide for yourself who the partners are to be or you can put four checkers in a hat, look out of the window, and draw. Partners sit on opposite sides of the table. One partner plays with the plain checkers and the other plays with those marked with a cross or band. One team uses red, the other plays with the black.

1. The player who drew the plain black checker opens the game. Play moves to the left.

2. The moves are the same as in regular checkers. One square diagonally, always staying on the black, and always progressing towards the further side of the board. When a king is made he can move either forward or backward one square at a time.

3. A piece is taken or removed from play whenever another piece jumps it. The jump is made by moving a counter two squares diagonally over another counter. A player can not jump his own pieces, but he must jump all other counters that happen to be in the way, *even his*

partner's. When a man is taken the player must move again. He must take every move.

4. A king is made when a player's piece reaches the back row on his partner's side of the board.

5. The game is won when one team completely clears the board of the opposition.

CHAPTER XXI

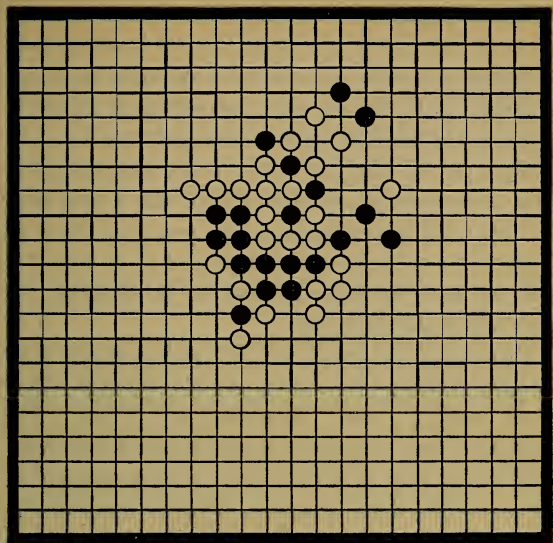
FIVE-IN-A-ROW

FIVE-IN-A-ROW is from the old Japanese game Goban, or Go-ban. Like most Oriental games it is a game of strategy, requiring clear thinking and clever playing. But unlike so many games that have come out of the East it is not at all complicated. In fact it is merely an elaboration of the good old game of Tit-tat-toe. But where the old game could accommodate only two players and all the moves could quickly be boiled down to a formula, two, three, or four people can play Five-in-a-Row and the number of combinations is almost limitless.

THE BOARD AND COUNTERS

Look through the chapter on Game Boards and pick the one you want to make. Probably it would be wisest to take the peg-board for Five-in-a-Row because the game requires a great many men and a slight jostle of the board would otherwise upset the layout. But you can play it with small checkers or buttons, or even beans, so read the whole chapter before you decide which will be your board.

For the peg-board you should have a piece of $\frac{3}{4}$ " hardwood about 17" square. Wood this wide is scarce so you will probably have to make the game from two or more boards glued together and reinforced with a frame as



The Board



$\frac{3}{4}"$



$\frac{3}{8}"$

$\frac{3}{8}"$



$1\frac{1}{4}"$



Counter

Peg

FIVE-IN-A-ROW

described on page 177. A good grade of $\frac{3}{8}$ " plywood will do as a substitute if your lumber dealer has it in stock. Ordinary western fir veneer-wood is too brittle. Don't take a chance on it. For the pegs you will need 12' of $\frac{3}{8}$ " dowel or one hundred small wooden golf "tees."

Mark out the board as shown in the diagram and on each intersection of the crossed lines bore a hole about $\frac{3}{8}$ " deep and large enough to take your pegs. Sand the board down and paint or stain it any color you wish. You will not need the lines as shown in the drawing. The pegs will be design enough.

Then cut up the dowel into $1\frac{1}{4}$ " sticks and sand them smooth, making the corners slightly rounded. Using water-proof ink, color twenty-five of the pegs black, twenty-five red, twenty-five blue, and leave twenty-five plain. If you have chosen golf "tees" as your pegs you will not need these dowel pegs, too. Paint the heads of your "tees" with colored enamel, leave the tails plain.

If you prefer the checker-style board you can make it of a $\frac{3}{8}$ " piece of plain plywood $23\frac{1}{2}$ " square. Two dowels $\frac{3}{4}$ " in diameter and 36" long will provide enough material for the counters. Sand the board down, rounding all the edges to make it neat and strong. Then stain the front and back and all edges with a light oak oil stain. After leaving the stain to set for a minute or so wipe off both faces of the board with a soft cloth.

When the stain has dried draw in the four hundred squares as shown in the picture. Make the lines with India ink and use a #2 lettering pen. It will give you a good

strong line and you can guide it with a straightedge. Finish off the board with a light coat of varnish.

Now cut the dowel into $\frac{3}{8}$ " slices and sandpaper them smooth as suggested on page 179. Paint one-fourth of them red, one-fourth black, one-fourth blue, and leave the rest plain or paint them yellow. That completes the outfit. Both games are played according to the same rules.

THE RULES

There are two ways to play Five-in-a-Row: the modern game and the ancient Go-ban. Two, three, or four people can play in either game. The object of the two games is the same: to get five counters in a row, either horizontally, vertically, or diagonally. The only difference between the two games is in the method of playing. I'll describe Five-in-a-Row first.

1. Players determine who is to open the game by drawing for color. The player getting black opens, blue follows, then red and yellow. Play always goes to the left so the players must sit around the board according to their colors.

2. A play is made by setting a counter or peg in any hole or cross-line on the board. If you are playing with checkers you can set them in the squares as is the Occidental system, but actually that is not the way to play the game. The counters should be set down where two lines intersect.

3. Players can not set down counters in a hole or space already occupied by another counter.

4. The game is continued, each player setting down a

peg in turn until all are down or until one of the players succeeds in placing five pegs or counters in a row. The first player to get five in a row wins the game. If no player succeeds in winning by the time he has placed all his counters the game is considered a draw.

5. The player who wins opens the following game.

GO-BAN RULES

The real Chinese Go-ban is a very complicated game so I've used a simplified American version here. The counters or pegs are limited to twelve or sixteen for each player. The object is the same as for Five-in-a-Row but the method of playing is divided into two phases. The first phase is exactly the same as the regular game of Five-in-a-Row, but if no player succeeds in winning the game and all players have placed their sixteen counters the second phase opens.

In the second phase each player moves any counter of his own color to any adjacent hole or space. He can move only one counter at a time and only one space. This continues until one of the players wins the game.

There is also a third game that can be played on this board. It apparently evolved from combining Go-ban with Nine Men's Morris, but so far it has not acquired a name. "Four-up" is the best descriptive title we've found for it so far. You can use that or make up one of your own.

In Four-up the plays are made as in Go-ban. Each player is given sixteen pieces and places and moves them on the board as described above. But when he gets four

pieces in a row he can remove any counter from the board that he wishes to take and that counter is put out of play for the remainder of the game. The removal must be made immediately upon the player's getting four in a row. A player may take two counters if he simultaneously gets two fours.

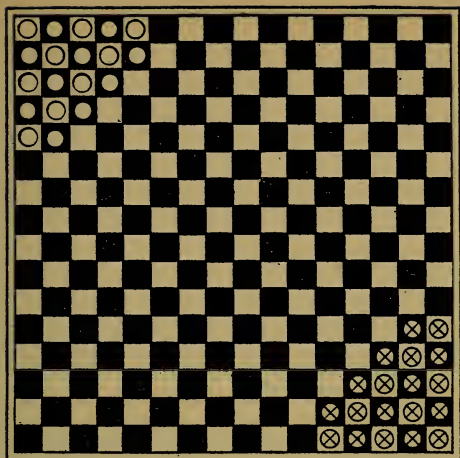
Game is won by the first player who places five counters in a row, or the player who reduces his opposition to four or less men. When more than two persons are playing they are automatically dropped from the game when their counters are reduced to four.

CHAPTER XXII

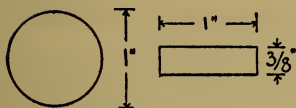
HALMA

HALMA is a game of fairly recent origin as good games go. That is, it's only about fifty years old. Two different men invented it at apparently the same moment, and there was quite a controversy at the time as to where the credit should go. I'm not at all sure how it turned out except that everyone soon forgot the fight and started in playing the game. Halma is rather unusual, requiring the utmost in skillful playing and strategy. With the one possible exception of Chess it is the table game taking the utmost in long-range planning.

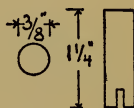
And yet it's a very simple game to learn and easy to make. It is the kind of game that grows on one, that has a mass of clever technique hidden behind its simple face. There are several designs for Halma but I'll give you only the two that have been most popular. The first is for two or four players, the second is for three to six. Mr. V. C. Brown, who first drew my attention to the three-handed game, has even made an outfit for five players. His is pretty complicated. Parker Brothers, the game makers, have recently developed a new game from Halma. They call it "Camelot." It is a little more complicated than its parent and is very popular with most Halma enthusiasts.



Checker Style - 2 or 4 Players



Checker



Peg

HALMA

THE TWO-HANDED GAME

In the chapter on Game Boards I've given suggestions for several different styles of boards that you can make. I prefer the one shown in the drawing; it's made of plywood. But many players would rather use a peg-board because there are many counters used in the game and the pegs are steadier. Below I'll describe both of these for you.

Make the plywood board from a 22" square of $\frac{3}{8}$ " fir veneer-wood and the counters from a 32" piece of 1" curtain pole or dowel. On page 170 I've told in detail how to make the board, and on page 179 how to make the counters, so I'll not repeat here.

It is not necessary to make the checked design on the board as shown in the drawing, but sometimes it will help you in the playing. You can mark out the squares in ink instead and it will be quite satisfactory. Don't put in the little circles and things, though. They are counters and I've left them in the picture to show you how to set up the board at the beginning of the game.

You will need thirty-six counters for the two-handed game and twenty-six more for the four-handed game. Saw them out of the 1" pole, making them each about $\frac{3}{8}$ " thick. Paint half of the counters black and half red. When the second coat has dried mark a red cross on thirteen of the black checkers and a black cross on thirteen of the reds.

If you would rather have a peg-board make it from a 15" square piece of hardwood about $\frac{3}{4}$ " thick, or from a

15" square of high-grade veneer-wood $\frac{3}{8}$ " thick. Use golf "tees" as counters or cut up 7' of $\frac{3}{8}$ " dowel into $1\frac{1}{4}$ " sticks. Directions for making the board are given on page 177, and for the pegs on page 181.

A little trick will help you lay out your board. With a pencil draw lines horizontally and vertically $\frac{7}{8}$ " apart clear across the board, leaving a 1" margin on each side. You will have only fifteen squares where you should have sixteen, but don't get excited. Bore your holes at each intersection of the pencil lines. That will give you sixteen holes to each side—the same as the number of squares. Paint the board any color you like. The holes will provide all the design that you will need, but you can put on the checks just the same if you wish.

Make sixty-two pegs. Color half of them black and half red with water-proof ink. Paint a red band around the middle of thirteen of the black pegs and a black band around the middle of thirteen of the red ones. Your game is finished.

PLAYING THE GAME

Play the first game or so two-handed until you get the hang of it. Then, if you want, get two more people in and have a four-handed game. Draw for color. Plain black opens. Set up the counters for the two-handed game as shown in the diagram.

1. The object of the game is for each player to transfer all his men to the corresponding position on the opposite corner of the board.

2. The move can be made to any vacant adjacent space in any direction. No piece can move more than one space

unless it jumps. If a counter is in an adjacent square a player may jump it whether it is his own man or his opponent's. But no pieces so jumped are removed from the board.

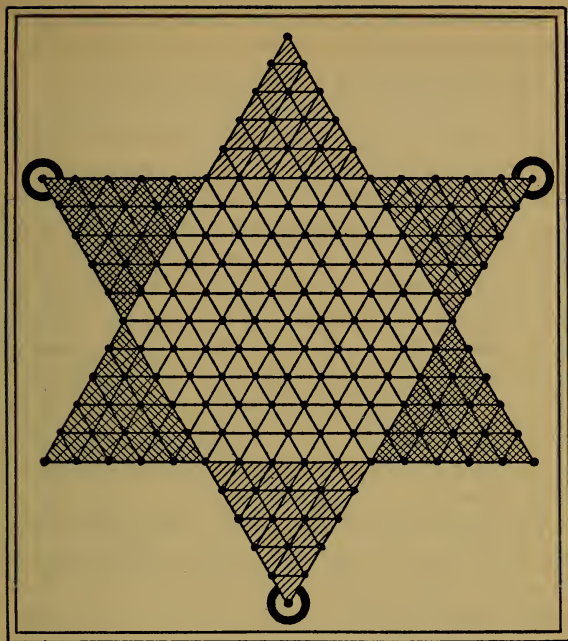
3. A jump is made by moving a counter in a straight line over another piece to the next square. After each jump the player can move his piece again one space. If this brings him next to another counter he can jump again. There is no limit to the number of jumps possible in one move as long as the pieces jumped alternate with open spaces, and a player can jump and move a space as long as the pieces are conveniently spaced. It is from this jump-step that the name Halma came. The Halma, a hop and a step, was the chief event in the ancient Greek Pentathlon.

4. The player first moving all his men to the proper position in the opposite corner wins the game.

5. In four-handed Halma all the rules above are followed with the single exception of Rule 4. The game is not won by a single player but by the two partners who first succeeded in transferring all their counters to the opposite corner. Each player is allowed only thirteen counters instead of nineteen. The partners' counters are set in diagonally opposite corners of the board in a layout similar to that for the two-handed game, leaving off the outside row of five pieces. Play progresses to the left.

THE THREE-HANDED GAME

The best board for the three-handed Halma is the peg-board, but here again many people prefer the flat board



Peg Style — 3 or 6 Players

HALMA

with the disk counters. Take your choice. The boards and counters are made the same size as described above for the two-handed game. The design alone is different.

The dots shown where the lines intersect in the drawing are supposed to represent peg-holes. You won't need them with the checker-style game, but putting them in will often help you with the play. The shaded areas on the board represent different colors. You will need three colors or shades.

Each player is given twenty-one counters for the three-handed game, and at the opening they completely fill his home point of the star. Home is shown in the drawing by the little bull's-eyes. The object of the game is to move directly across the board to the opposite star point. The first player getting there with all his counters wins the game. Rules are the same as given above for the two-handed game.

The six-handed game is a bedlam. It takes more courage than science to play. Each player is given thirteen pieces, the eight outside counters being omitted. Partners play from opposite star points and try to move their pieces across the board to the point vacated by their partner. The first two partners transferring all twenty-six pieces win the game.

CHAPTER XXIII

NINE MEN'S MORRIS

NINE MEN'S MORRIS is one of the very old English games that has managed to live on through the years. It is not at all difficult to find reasons for its hardihood after you have once played the game, for it is one of the best two-handed table games still in existence. Like checkers the initial moves are very easy to learn, and like checkers and all other good games it allows a surprising variety of play and every fresh game teaches something new.

In Elizabethan times Nine Men's Morris was played with pebbles and sticks on a diagram cut in the sod with a jack-knife. Later, in our own pioneer days, it was dignified by being given a board and counters of colored corn. The Elizabethan game is the perfect one for whiling away sunny hours at the beach. You can mark the diagram in the sand and use round stones or shells for pieces. But at home during the winter a regular board will be better. Below I'll describe two different kinds for you.

THE BOARD AND COUNTERS

The board pictured is to be used with checkers. I like it the best but you may be able to pick one that you would prefer from the chapter on Game Boards. Make it 16" square, and cut your checkers from a 9" length of 1¼" curtain pole. For complete details on the board turn

back to page 170, and for the counters turn to page 179.

The circles shown in the picture are not at all necessary and are, in fact, only my own added refinement. They help a bit to visualize the game. You will need only eighteen counters altogether, nine black and nine red.

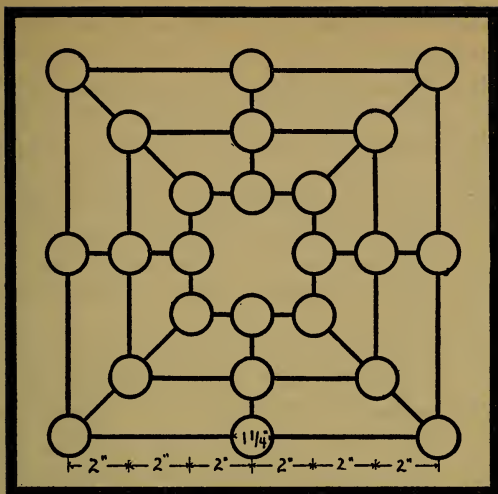
You can make a very handsome little peg-board one-half the size of the one in the picture. Use wooden golf "tees" or small dowel sticks as pegs, and make the board from a $\frac{1}{2}$ " piece of hardwood 8" square. Don't paint on the circles in the peg-board. You will not need them. Bore holes for the pegs in their place instead.

THE GAME

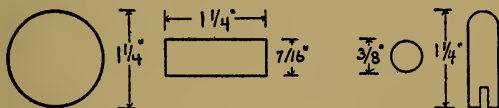
Both boards are played in the same manner and according to the same rules. The game is divided into three phases. I'll try to explain them to you below.

1. Each player sets his men down one at a time, placing them in any free circle. If at any time a player manages to place three pieces in a row he can remove from play any one of his opponent's counters. The removal must be done immediately upon getting three in a row. All pieces so removed are dead and can not be played again.

2. When both players have placed all their men the second phase opens. The men are moved around the board one space at a time, in any direction, each player moving in turn. The object is still to place three in a row, and every time a player gets his three he can remove one of his opponent's counters. The removing is called "pounding." It came from the old English game where the pieces removed were "impounded."



The Board



Counter

Peg

NINE MEN'S MORRIS

3. The third phase opens when one of the players is reduced to three counters. Then he may move his men one at a time to any open space on the board. He does not have to follow the lines. The other player, however, can not jump his counters unless he, too, is down to three.

4. Game is won by the player who successfully pounds all but two of his opponent's pieces. In the old game a player had to pound all the other men. But that seems unnecessary because when a man is down to two he is already beaten. He can not possibly pound any of his adversary's pieces.

5. No player can use the same combination of three twice in one game. He may move his men into that combination as many times as he wishes but can pound only once with it, and that must be the first time he makes it. But if a player gets two combinations of three in one move he may remove two counters.

CHAPTER XXIV

FORTYNINER

THE Fortyniner lived a rugged life with the Injuns and badmen and gamblers all hunting for his scalp and gold. But he found a big kick in the life just the same, and never did he enjoy it more than when he found color in his pan, when he discovered a claim that would bring him a fortune. The Injuns have given up scalp-hunting now, and the gamblers and badmen are pretty scarce, and most of the real Fortyniners have gone to their happy panning grounds. But you can still have some of the fun they enjoyed so long ago. You can stake out your claim and fight the other fellow for the ownership of your bonanza.

The game of Fortyniner is not quite as dangerous as it used to be and the rules are refined a little for a more tender age. But the object is the same as it was three-quarters of a century and more ago—stake out your claim before the other fellow beats you to it! It's a game in which luck has only a little part, in which skill and foresight win. And like most good games the rules are brief, the playing long.

THE BOARD AND COUNTERS

You can pick a board from those described under the chapter on Game Boards or you can make the one I've drawn in the picture. It's simple yet handsome, fun to make and yet not difficult.

Get a piece of $\frac{3}{8}$ " plywood 14" square and a dowel $\frac{3}{4}$ " in diameter and 25" long. In addition to this you will need paint, of course, and one hundred and twelve $\frac{3}{4}$ " metal or rubber washers. If you wish you can make wooden counters instead of using the washers suggested. But cutting out and sandpapering one hundred and twelve of them will be a bit tedious.

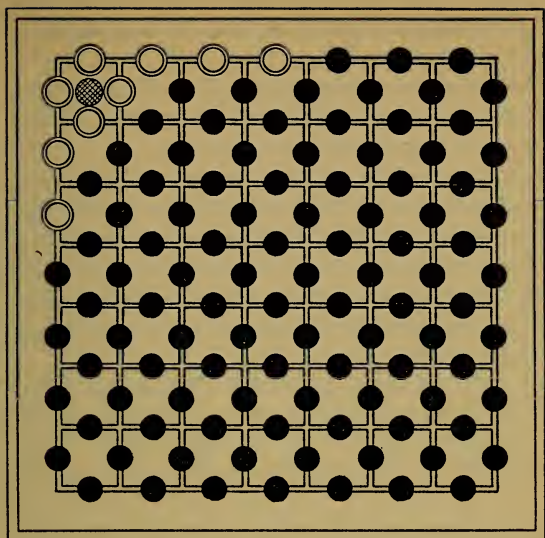
The squares shown on the board in the picture are $1\frac{1}{2}$ " on the side. The black circles are not necessary but help you play the game properly and will give an interesting air to the board. Of course, if you make the peg-board the circles will serve no use at all. You will bore the holes there instead.

I suggested that you get some dowel as well as the washers. Cut it up into forty-nine disks each $\frac{3}{8}$ " thick. Paint one side of these red and the other black, or paint them gold and silver to keep the game in character. You will need forty-nine of the two-colored counters and one hundred and twelve plain ones.

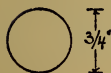
PLAYING THE GAME

The object of Fortyniner is to stake out as many claims as possible. The one having the most claims at the end of the game wins. The claims are staked as follows:

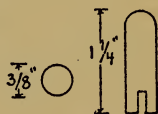
1. Toss a black-and-red counter for color. Black opens the game by setting down a plain counter on any circle on the board. Red follows, placing another plain counter on any circle adjacent to the one already containing a counter. An adjacent circle is *not* a circle on the other



The Board



Counter



Peg

FORTYNINER

side of the square. It must be on an adjoining side of the square or claim.

The two players continue setting down the plain counters, taking alternate turns, trying to completely fill in a square or to keep the other from doing so.

2. When one of the players stakes out a claim he sets a colored counter in the claim with his color up. He need not put in all four stakes or counters. It is his claim if he puts in the fourth even if the other player put in the other three. Each time a player stakes a claim he is given one additional turn. He can continue to play until he can no longer fill out a claim.

3. At the end of the game when all claims are staked the player who has the most color on the board wins.

CHAPTER XXV

PUZZLES

THERE must be a million or two puzzles, for puzzles are older than history. Our stone-age forebears worked out puzzles in the mouths of their caves. Even the lashing of their stone hatchet heads on the forked-stick handles must have been a puzzle to them, a puzzle which they had to solve, for their lives depended on the success of their solution. And all down the ages since then man has been working out puzzles, sometimes for fun, sometimes for survival. We have enough of the survival puzzles even today. But the habit sticks with us and we solve mysteries for fun.

I have included just a dozen and a half for you to work on. They are all puzzles in the real sense, none tricks. The tricky ones are likely to fall flat when you stumble across the solution, so I've left them out and have put in only those that take ingenuity and clear thinking. There are four kinds here, covering four of the six main types. I've left out puzzles made with bent nails and wire. They are seldom interesting and are really too difficult to make properly in an average work-shop. I have also excluded jig saw puzzles for two different reasons. The first is that they are not really puzzles. They take neither ingenuity nor cleverness to solve. Patience is all that you need, and patience is all that you have to have if you are going to

make them. I couldn't tell you a thing about their construction that you do not already know.

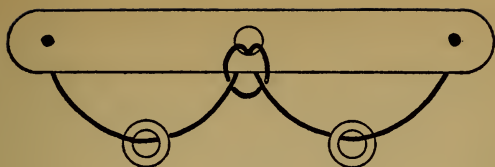
The easiest puzzle to make is the hardest to solve. But the vice versa does not hold true because the hardest to make is the next to the hardest to solve. Possibly your abilities are different from mine and you will find the hard ones easy and the easy ones hard. But in case you should get completely stuck on any of them I've put in the solutions. They are hidden away at the end of the book where they will not tempt you.

STRING PUZZLES

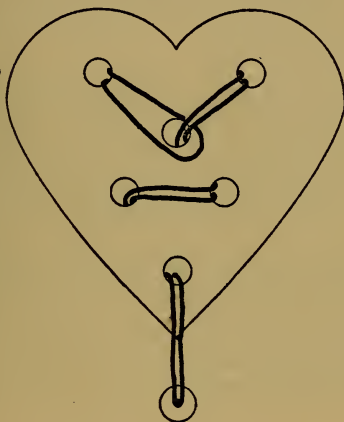
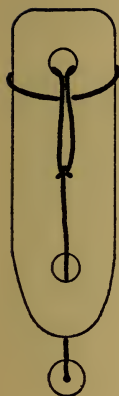
Most of the string puzzles are very simple, and most of them look impossible to solve. They are good ones to start on because of those very two reasons. They will make a puzzle fan of you.

The best wood I ever found for these came out of an old broken desk. The thin partition strips in the drawers were just right, hardwood about $\frac{1}{8}$ " thick. The second best wood is from cigar boxes, and the third best, the easiest to work and to get, is plain three-ply veneer-wood $\frac{3}{16}$ " thick. A single piece $3\frac{1}{2}$ " wide and 12" long will be sufficient for all four puzzles.

You will need string, too, and buttons or washers. A couple of yards of fish-line or chalk-line will be best. Half a dozen plain suspender buttons or $\frac{3}{4}$ " plain metal washers will complete your list.



TWO WASHERS PUZZLE



BOWLINE

HEART

STRAP

STRING PUZZLES

TWO WASHERS PUZZLE

This little puzzle is very old and has masqueraded its way through the ages under a variety of names and disguises. Originally, I believe, it was called the "String and Beads." Then some lovelorn fellow substituted two little hearts for the beads and called it the "Lover's Puzzle," because the object of it was to get the two hearts together on the same loop. And now that we are living in the machine age, romance is put in the background and washers are hung on the string.

Cut a $\frac{1}{2}$ " strip of your wood $3\frac{1}{2}$ " long, as shown in the diagram. Bore two small holes about $\frac{1}{2}$ " from each end and a larger hole in the center of the strip. Hang the two washers on a 6" piece of string as shown in the picture. Tie the two ends of the string securely in the small end holes.

Now your puzzle is finished. Try to move the two washers around so that they are both hanging on the same loop of string. It is against the rules to untie the string, to break the stick, or to pull the knots through the holes. It looks impossible. But it can be done!

THE BOWLINE PUZZLE

The Bowline Puzzle is a very simple one and not at all hard to work out. Cut your strip of wood as shown in the picture, making it about 4" long and $1\frac{1}{4}$ " wide. Bore two $\frac{1}{4}$ " holes in it as shown. Tie a bowline or a loop in the end of an 8" piece of string. Put it through the top hole from the front and fold it back again over onto the front.

Then lay the standing part of the string *over* the front of the loop and thread it through the bottom hole. Leave about 4" of string free and tie a button or washer securely to the bottom of the string.

Try to remove the string from the strip. That's all there is to it. But you can't untie any knots, and you won't need to use force.

THE HEART PUZZLE

This is another impossible-looking puzzle, but like all the rest it can be worked out if you stick to it. Make it about 3½" high and 3½" wide. Cut it out of paper first to get it symmetrical. Trace the heart out on the thin wood and saw it out with a coping-saw. Bore six holes in it as shown in the diagram. Take about 24" of string and lace it to the heart in this way: fold it in the center and thread the loop through the upper left hole from the back; hold it there with your thumb and thread the two free ends through the upper right hole, down through the loop and the upper center hole, to the lower left, across to the lower right, down through the lower center. On the end of the string tie a washer or button too large to slip through the lower hole. You should have about 6" of free string below the bottom hole.

Now try to unlace the string from the heart without untying the button. Can't be done? Stick to it and see.

THE STRAP PUZZLE

You will need one additional bit of material for this. Get an old piece of fairly pliable leather about 1" wide and 4" long. A piece of an old belt will do. In the center

cut a strip about $\frac{1}{4}$ " wide and $2\frac{1}{2}$ " long as shown in the diagram. $\frac{1}{2}$ " lower down cut a $\frac{1}{4}$ " hole. Run a 6" piece of string up through the hole from the back side, under the $\frac{1}{4}$ " strip and down through the hole again. On each end of the string tie a button or washer large enough to keep from going through the hole.

This puzzle is very nearly a trick, but not quite. The object is to remove the string from the strip without untying the buttons or breaking anything. Try it.

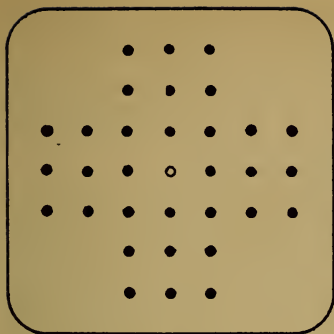
THE PEG PUZZLES

There are a lot of peg puzzles, but as far as I have been able to find there are only three main types. Here I've included the best examples that I know of each, and if you are ingenious you can start with these and devise some new ones that will test both your inventiveness and cleverness. Make the 33 Peg Puzzle first. It is the easiest to solve for it takes more endurance than brilliance.

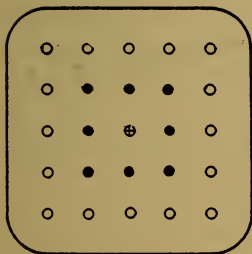
THE 33 PEG PUZZLE

You can make this in three ways, all alike, each just the slightest bit different. The one pictured is made of $\frac{1}{2}$ " hardwood 6" square, and the thirty-three pegs are made of $\frac{1}{4}$ " dowel $1\frac{1}{4}$ " long. You can build the same board and use eight-penny nails instead of dowel. Or you can make a board just half the size and use 1" brass escutcheon pins for pegs. The brass pins make a very handsome small outfit that you can carry around and solve at odd moments.

Bore the holes in the board according to the diagram.



33 PEG



9 PEG



ALTERNATE

PEG PUZZLES

Don't cut the holes all the way through the board. If you want to make a guide to help control the bit there is one suggested on page 177. When the holes are finished sandpaper the board smooth and stain or paint it. Then set in the thirty-three pegs as shown by the black spots in the picture. Leave the center hole open.

Now try to remove all the pegs but one from the board. The last peg must be left in the center hole. To remove a peg it must be jumped by another peg. You can jump in a straight line either horizontally, vertically, or diagonally.

I haven't given a solution to this because it is really comparatively easy to work out. The fun in it is in trying to solve it differently each time you try to do it, and to solve it in the least possible moves. A move is counted as in checkers. If you jump more than once in the same turn with the same peg it is one move. It can be done in thirty-one jumps, and in less than half that number of moves.

You can also make up problems to solve on this puzzle board. Use less than the full number of pins and try to work it out. Or you can devise some really clever problems by beginning with a peg in the center and working backwards, placing the pins in such a manner that you can remove them all in one move. See how many pins you can do that with.

There is another puzzle very similar to this one but using forty-five pegs. Get a board $1\frac{1}{2}$ " larger for the dowel puzzle, or $\frac{3}{4}$ " larger for the escutcheon pin puzzle. Add a row of three holes to the outside of each group, making four groups of nine pegs around a center group

of eight. This is more complicated than the 33 Peg Puzzle and takes forty-three jumps to solve. You can spend hours with either of these famous old puzzles, working out your own solitaire games.

THE 9 PEG PUZZLE

You would think that the 9 Peg Puzzle would be easier to work than its 33 Peg and 45 Peg brothers. But actually it is as much harder to solve as it is easier to make.

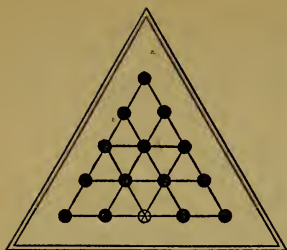
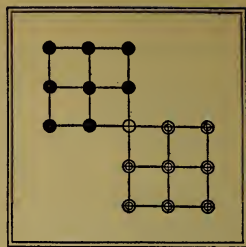
Use either $\frac{1}{4}$ " dowel or the 1" escutcheon pins for pegs. The dowel puzzle will require a $4\frac{1}{2}$ " square of $\frac{1}{2}$ " hardwood and the escutcheon pin puzzle a piece half the size. Bore the fifteen holes as shown in the diagram and set in the nine pegs. The center peg should be a different color from the rest, or if it is an escutcheon pin it should have a little cross filed in the head to help you recognize it.

The object of this puzzle is to remove eight of the pins by jumping, and to end up with the center pin back in the center. Jumps are made in a straight line in any direction. You can't move a pin unless it is to jump one of the others. So far I have found two ways to do it in three moves. I'd like to hear of the person who can do it in one!

THE 14 PEG PUZZLE

The 14 Peg Puzzle is about the easiest of all the peg puzzles, but since all the moving is on the diagonal it is often difficult for people to visualize. That's one of the good things about peg puzzles: even if you solve one of them it seldom helps you to solve any of the rest.

Make the pins either with $\frac{1}{4}$ " dowel, cutting them each

**14 PEG PUZZLE****16 PEG PUZZLE**

1 $\frac{1}{4}$ " long, or with 1" brass escutcheon pins. The dowel puzzle will take a triangular piece of hardwood $\frac{1}{2}$ " thick and 5 $\frac{1}{4}$ " on each side, and the escutcheon pin puzzle will take a piece one-half the size but of the same thickness. Bore fifteen holes as shown in the diagram, spacing them $\frac{3}{4}$ " apart for the dowel and $\frac{3}{8}$ " for the escutcheon pins. Then put in the fourteen pegs. The center hole in the bottom row should be left empty. The lines that I've drawn in the diagram are not absolutely necessary but will help guide you when working out the puzzle.

Now, by jumping the pegs as in Checkers, following the lines, try to remove all the pegs but one from the board to end up with the last peg in the center hole in the bottom row. You can't move a peg unless it is to jump another one, according to the rules of the game. The puzzle can be solved in thirteen moves. If it comes too easily paint one of the pegs a different color from the rest. Then try to end up with that peg in the bottom center hole!

THE 16 PEG PUZZLE

Here's another of the peg-shifting puzzles. Almost anyone can solve it in a hundred or so moves. But that's not the game. See if you can do it in less than fifty moves. It can be done in forty-six!

In a $4\frac{1}{2}$ " square of $\frac{1}{2}$ " hardwood bore seventeen $\frac{1}{4}$ " holes as shown in the diagram, setting them $\frac{3}{4}$ " apart. Make sixteen $1\frac{1}{4}$ " pegs from some $\frac{1}{4}$ " dowel and color half of them red and half of them black. Waterproof ink will be better than paint and will dry much faster. Then set up the board as shown in the drawing, leaving the center hole empty.

Now try to shift the pegs so that the red ones occupy the position formerly taken by the black, and vice versa. Pegs can be moved only from one hole to the next, following the lines, or they can be jumped over a peg if the following hole is empty. Pegs so jumped are not removed from the game. Diagonal moves are not allowed.

THE ALTERNATE PUZZLE

This is the puzzle that I think is the hardest one to solve, though it certainly does look simple. Cut out a piece of hardwood as shown in the diagram, making it $9\frac{3}{4}$ " long, $1\frac{1}{2}$ " wide and about $\frac{1}{2}$ " thick. Make eight pegs from a piece of $\frac{1}{4}$ " dowel and color four of them black and four red. Set them up as shown in the diagram with the four red pegs on one side of the center and the four black on the other side.

Now try to move the pegs, taking two at a time so that

they will end up in alternate order. You can move the pegs to any two empty holes, but you must not change the pair's order when moving. For instance: if you move the two center pegs to the two upper holes the black peg will be in the lower hole and the red peg in the upper. It is not very hard to do this in five moves. But it is very hard to do it in four. So the problem is to alternate the pegs in four moves!

CONSTRUCTION PUZZLES

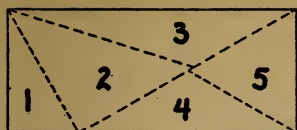
These block puzzles are among the first in type to come up in history as actual games. Those described below are all quite old, and all very interesting. I believe that they cover rather fully the several kinds of puzzles in their specific order.

THE "T" PUZZLE

The "T" Puzzle is the oldest, so I will give it first place. Make it from a piece of wood about $\frac{1}{4}$ " thick and 7" long. Saw the strip as shown by the dotted lines in the diagram. All the angles are right angles or forty-five degrees. Sandpaper the pieces slightly. Throw away the one piece that is not numbered and try to make a simple block "T" from the pieces that are left. If you can make a "T" with the five pieces you have solved the puzzle.

THE "F" PUZZLE

The "F" Puzzle is a twin to the "T." For it you will need a strip of wood about $2\frac{1}{2}$ " long, $\frac{3}{4}$ " wide and $\frac{1}{4}$ " thick. Saw it out as shown by the dotted lines in the diagram and throw away the eighth unnumbered piece. Try to make a block "F" from the remaining seven pieces.

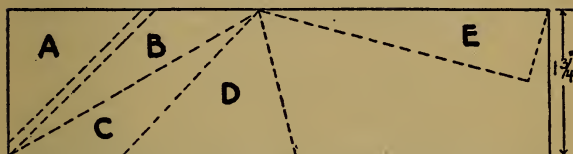


$1\frac{1}{2}$ "

THE TRIANGLE PUZZLE

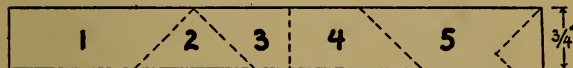
$7/8$ " $2\frac{5}{8}$ "

$1\frac{5}{8}$ " $1\frac{1}{4}$ " $3\frac{1}{2}$ "



$1\frac{3}{4}$ "

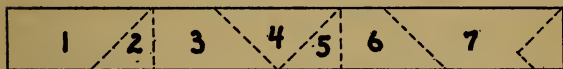
$1\frac{3}{8}$ " $2\frac{1}{8}$ " $2\frac{7}{8}$ "



$3/4$ "

$1\frac{1}{2}$ " $1\frac{1}{2}$ " $3/8$ " $1\frac{5}{8}$ " $1\frac{1}{16}$ "

THE "T" PUZZLE



1 " $3/4$ " $1\frac{1}{2}$ " $3/4$ " $1\frac{1}{4}$ " $1\frac{1}{16}$ "

THE "F" PUZZLE

If you have made the "T" you should have little trouble. But I've seen people get stuck worse on the "F" than they did on the "T." It is a puzzle to me why that should ever happen.

THE TRIANGLE PUZZLE

Maybe I should have put this in the plural because there are really two triangles to it. One of the triangles, though, is a hoax and I'm warning you ahead of time so you won't feel cheated when you try to make it. One of the triangles is inside out, if you get what I mean.

Use a strip of pine or other easily worked wood $1\frac{3}{4}$ " wide, $\frac{1}{4}$ " thick and 11" long for the puzzle. You should also have a box as a part of the puzzle and you can make a handsome one from another piece of $\frac{1}{4}$ " wood $3\frac{1}{2}$ " square and a third piece $\frac{3}{4}$ " wide and 16" long.

Saw out the puzzle as shown in the diagram. The dividing line between pieces 2 and 3 looks as if it is in the wrong place. But it isn't; that is not a mistake in the picture. I drew it that way on purpose.

When the pieces are all cut out you will have to paint them or stain them and if you do it wrong you will probably never solve the puzzle. So follow these directions very carefully. Paint or stain the front side of 2, 3, 4, 5, and E, and the back side of 1, A, B, C, and D. To tell the front side from the back rearrange the pieces as shown in the drawing, or as they were before you sawed them up.

Make a box of the rest of the wood. It should be $3\frac{1}{2}$ " square on the inside and about $\frac{1}{2}$ " deep. You can paint it, too, if you want, but it won't help you solve the puzzle.

Now, using either set of pieces, try to make an equilat-

eral triangle in the box. If you succeed try to make a triangle with the other set. And if you still succeed make a triangle with all the pieces! Here is where the paint comes in, and the trick!

THE SQUARE PUZZLE

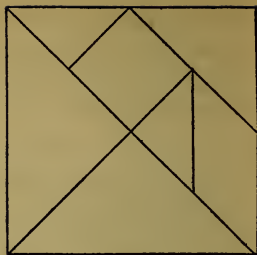
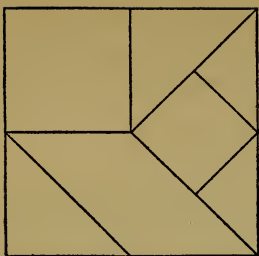
This isn't at all a difficult puzzle, though it is at times rather baffling. But if you find it too easy you can fix it up so that it is almost impossible for anyone who is not color-blind. I'll tell you how below.

Use a strip of easily worked wood, pine or plywood, a little over 4" wide and about 6" long. Mark out the pieces as shown in the diagram, or trace them off on transparent paper and transfer them to the wood with carbon paper. Saw out each piece carefully, keeping the saw-cut on the outside of the lines. Then sandpaper the pieces slightly to make them smooth and attractive. You can leave the puzzle plain or paint it, or you can paint one side black and the other side red and if it doesn't confuse you it will confuse anyone else who tries to work it out. Now, using all four pieces, try to make a square!

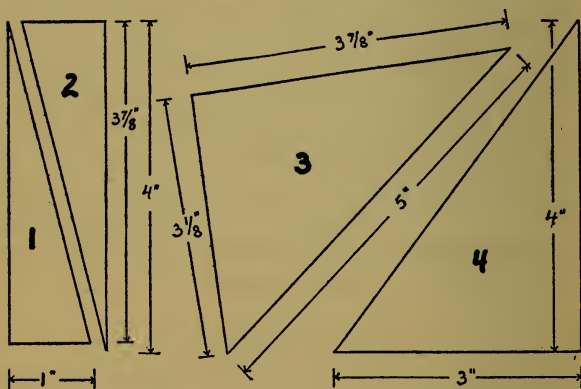
CHINESE TANGRAMS

Tangrams in themselves are not puzzles. They are games. But they are often very puzzling games, so I have put them in here. You can play the games, and then you can try them on your friends and see where the puzzle comes in. Complicated? Not at all.

Take either one as a starter. Get a piece of pine or other wood about $\frac{1}{4}$ " thick and 3" square and saw it into seven



CHINESE TANGRAMS



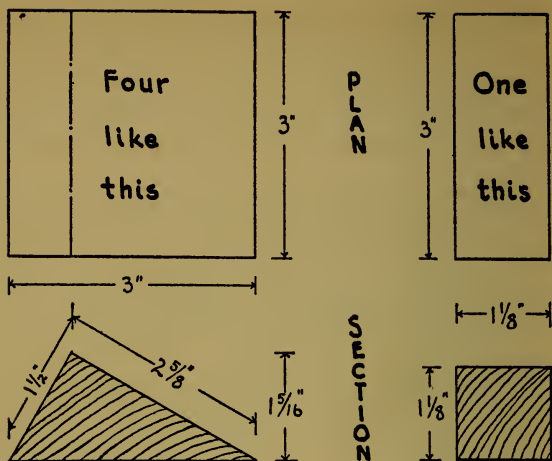
SQUARE PUZZLE

pieces as shown in the picture. Sandpaper the pieces smooth, put them together again to see if they fit, and if they are all right paint them black on one side and red on the other. When the paint is dry you should be able to make a square that is red on one side and black on the other.

Now comes the game! With these seven pieces you can make an almost limitless number of amusing or bizarre silhouette figures. In China they have played the game for centuries and have thousands of different figures. Each time you make a silhouette that looks like something trace its outline on a piece of paper. Then some day you can have a party! Have a Tangram on hand for each player, exhibit your outlined silhouettes, and ask them to see if they can copy the figure with the seven pieces. Or ask someone to make a cow, or a chicken, or an old lady falling down the stairs. It's lots of fun!

THE CUBE PUZZLE

Use any kind of wood $1\frac{1}{2}$ " thick, 3" wide and 14" long. Cut out five pieces as shown in the picture. The top angle of the triangular pieces is ninety degrees, the lower left is sixty, and the lower right thirty degrees. Sandpaper the pieces a bit to make them smooth. Then try to build a cube, using all five pieces. It is fairly easy. When you try it out on your friends give them three to five minutes to solve it. Or maybe you had better solve it in three minutes yourself first!



CUBE PUZZLE

BLOCK MOVING PUZZLES

Either of these puzzles will keep you up all night. They look simple enough, but behind their innocent exteriors a wicked heart lurks. You can run into all sorts of trouble if you don't watch yourself carefully, if you don't follow through a thought-out plan. But at least you shouldn't have much trouble making them, just blocks in a box.

For the Nine Block Puzzle you will need a piece of $\frac{1}{4}$ " pine or plywood $3\frac{1}{4}$ " wide and 4" long, another piece $\frac{1}{4}$ " thick, $\frac{3}{4}$ " wide and 16" long, and a third piece $\frac{3}{8}$ " thick, $1\frac{1}{2}$ " wide and 8" long. Make the box from the $\frac{1}{4}$ " wood

as shown in the diagram. Nail and glue the $\frac{3}{4}$ " strips to the bottom board with $\frac{7}{8}$ " wire brads and a good grade of fish-glue. Then cut out the nine blocks. Be careful to make them just a bit larger than required so that you can sandpaper them down to the right size. Sandpaper the corners slightly, too, to improve their appearance and make it easier to shift them around.

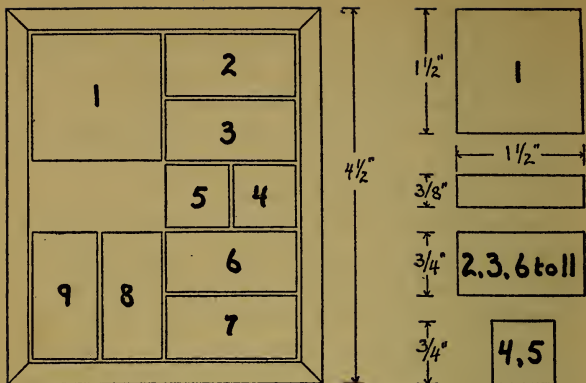
Put the blocks in the box as shown in the diagram. You need not number them. I did it just to help you in the construction and as a key to the solution. The object of the puzzle is to shift the pieces around so that the large #1 piece ends up in the position occupied at the beginning by #8 and #9. You can shift the blocks any way you wish. But you must not remove them from the box, move one over the other, or turn them around. You can solve this puzzle in fifty-two moves.

THE ELEVEN BLOCK PUZZLE

The Eleven Block Puzzle is just a little more complicated than the smaller one. It has another advantage, too, for there are several different problems that you can try to solve with it. In the picture I have shown the layout for three of them. You can invent some more for yourself.

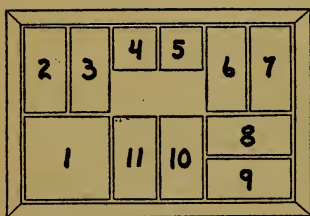
Make the box from a piece of $\frac{1}{4}$ " pine $4\frac{3}{4}$ " long and $3\frac{1}{4}$ " wide, and a second piece of the same wood $\frac{3}{4}$ " wide and 18" long. Cut the blocks from a $\frac{3}{8}$ " piece of pine $1\frac{1}{2}$ " wide. Follow the directions above for the construction.

The easiest problem of the three that I will give you is Problem One. Set the blocks up as shown in the drawing



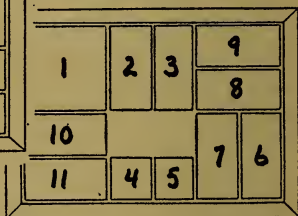
NINE BLOCK PUZZLE

BLOCKS



Problem #1

Problem #2



ELEVEN BLOCK PUZZLE

and try to move block #1 to the position occupied by blocks #6 and #7. It can be done in forty-four moves.

Problem One-A is done with the same set-up, but is a little more difficult. The object is to move Block #1 to the opposite corner, the corner occupied at the start by blocks #8 and #9. It takes about sixty-eight moves.

Problem Two is really difficult. Set the blocks up as shown in the diagram. Try to move the big block, #1, to the upper right hand corner where #8 and #9 are situated at the beginning. The least number of moves that I've been able to solve it in is one hundred and six. But you may be able to do better.

CHAPTER XXVI

PUZZLE SOLUTIONS

Few Puzzles are really difficult to solve if you go about them right. You won't have to use force or any trick devices on any of the puzzles given here. But you will have to be ingenious for some and awake for others so that you can see the solution when you get to it. A systematic attack on any of these problems will generally bring the answer. An unorganized fumbling will sometimes cause an accident and a sudden unfolding of the solution, but very seldom will it do anything more than complicate it for you.

All the solutions are given below with the exception of a few that are better shown in the drawing and the 33 Peg Puzzle which I've left to you. There must be a thousand possible solutions to the 33 Peg Puzzle, and a thousand more that you can make up for problems on the same board. I'll leave them to you.

THE TWO WASHERS PUZZLE

Slide the left washer up the string and through the loop. Then loosen the string slightly and pull the loop through the hole. The left washer is now in a position to slide to the right along the string to the other swinging trapeze. Move it over, pull the loop back to its original

position, slide the washer around the loop and down. To separate the washers again just reverse the procedure.

THE BOWLINE PUZZLE

This one is very easy if you go about it right. Pull all the string up through the bottom hole and pull the knot through the top hole. Now slip one side of the loop over the top of the strip and push the tip of it through the bottom hole from the front of the strip. Be very careful not to twist the loop at all. If you do you will run into difficulty. But if you haven't twisted it you can now slide the button through the loop, draw the loop back through the bottom hole, and the string will fall into your hand. To put it back again just reverse.

THE HEART PUZZLE

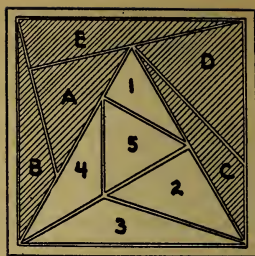
The principle behind the Heart Puzzle is the same as that behind the Bowline. Draw in all the slack string that you can from the bottom end up to the loop at the upper center hole. Now thread the loop back through the center top hole to the lower right, lower left, and lower center. Don't twist the string! If you have done it properly this far you will be able to slip the buttoned end of the string through the loop, thread the loop back again through the hole and be amazed at how easy it came off.

THE STRAP PUZZLE

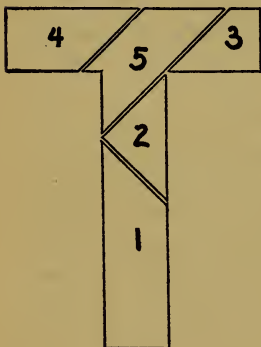
This is a good one! Hold the strap in your left hand and the two buttons in your right. Bend the strap in the middle and pull on the two buttons. If you pull hard



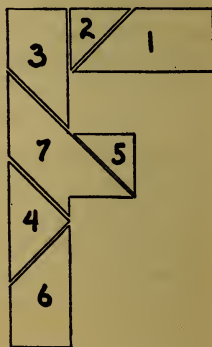
CUBE



TRIANGLE



"T"



"F"

SOLUTIONS TO PUZZLES

enough the string will pull the leather strip through the hole and you can slip the buttoned string off! That's all.

THE NINE PEG PUZZLE

Here is one way to do the Nine Peg Puzzle in four moves.

Jump the center peg horizontally right, diagonally up and left, down and left, down and right. Then jump the lower corner peg horizontally to the left. Jump the center upper peg diagonally down and left, horizontally right. That makes three moves. The fourth move is to jump the inner peg over the only other peg left and it will land in the center hole. This is only one of the many solutions. There is a lot of fun in working the others.

THE ALTERNATE PUZZLE

There are several ways, most of them rather easy, to solve this puzzle in five moves. But I know of only one way to do it in less. Number the holes and pegs so that you can follow the directions. Call the upper empty holes A and B, the pegs 1, 2, 3, 4, 5, 6, 7, 8, and the bottom holes C and D. Now move 6 and 7 to A and B; 3 and 4 to spaces formerly occupied by 6 and 7; 5 and 1 to 3 and 4; 4 and 8 to B and 1. It will take a fifth move, pegs 7 and 4 to spaces 7 and 8, to center the pegs. But that was not a part of the bargain.

THE 14 PEG PUZZLE

There are many different ways to solve this puzzle but I'll give only one of them here. Number the holes from

1 to 12 beginning with the center hole of the bottom row and following around the outside to the right, back to where you began. Then number the two lower inside holes 13 and 15, and the upper inside hole 14. Numbers count for the hole or for the peg that happens to be in it at the time. Now:

- | | | |
|----------------|-------------|-----------------|
| 1. Jump 5 to 1 | 5. 1 to 5 | 10. 8 to 15 |
| 2. 7 to 5 | 6. 6 to 4 | 11. 5 to 1 |
| 3. 8 to 15 | 7. 3 to 5 | 12. 2 to 12 |
| 4. 4 to 6 | 8. 12 to 14 | 13. And 11 to 1 |
| | 9. 10 to 8 | |

THE 16 PEG PUZZLE

The 16 Peg Puzzle is both easy and hard to solve. You may have worked it out in the first try. But probably your score was far above fifty. If it was and you can't get below try the solution following. U means Up, D is Down, R is Right, and L means Left.

- | | | | |
|------------|------------|------------|------------|
| 1. Move R | 12. Move U | 24. Jump U | 36. Jump L |
| 2. Jump L | 13. Move R | 25. Move D | 37. Jump D |
| 3. Move L | 14. Jump L | 26. Jump D | 38. Jump R |
| 4. Jump R | 15. Move D | 27. Jump R | 39. Jump R |
| 5. Move U | 16. Jump R | 28. Move U | 40. Move L |
| 6. Jump D | 17. Move U | 29. Jump D | 41. Jump L |
| 7. Move D | 18. Jump D | 30. Jump L | 42. Move R |
| 8. Jump U | 19. Move R | 31. Jump U | 43. Jump U |
| 9. Jump R | 20. Move U | 32. Move R | 44. Move D |
| 10. Move L | 21. Jump D | 33. Jump L | 45. Jump D |
| 11. Jump L | 22. Move L | 34. Jump U | 46. Move U |
| | 23. Jump U | 35. Move R | |

THE SQUARE PUZZLE

I didn't draw a picture for the solution of this puzzle because it is so easy to tell you how it's done. Begin with the piece marked "4." One side of 3 will fit against one side of 4. Put them together. One side of 1 will fit on one of the sides of 3. Put them together. Now, if you are careful you can just fit 2 against 1 and 3, and if you do it right it will make a square. If it doesn't make a square it is not your fault. The smallest angles of Nos. 1, 3, and 4 should all point in the same direction to form one corner of the square. Maybe I should have told you that at the beginning.

THE NINE BLOCK PUZZLE

This is not at all difficult if you move the blocks according to a plan. The directions below do not show the plan, but once you begin moving the blocks around you will catch on to the system. U means Up; D is Down; R is Right; and L means Left. There is generally only one space to move into anyway so you shouldn't go wrong. Here it is:

- | | | | |
|------------|-------------|-------------|-------------|
| 1. 1 D | 10. 5 & 4 D | 19. 4 & 5 L | 28. 4 & 5 U |
| 2. 2 L | 11. 1 R | 20. 1 D | 29. 8 R |
| 3. 3 U | 12. 9 R | 21. 3 D | 30. 9 D |
| 4. 5 U & R | 13. 8 U | 22. 2 R | 31. 4 L & D |
| 5. 1 R | 14. 6 L | 23. 9 U | 32. 2 L |
| 6. 9 U | 15. 5 L | 24. 4 U | 33. 3 U |
| 7. 8 L | 16. 4 U | 25. 5 R | 34. 4 & 5 R |
| 8. 6 L | 17. 7 R | 26. 8 D | 35. 2 D |
| 9. 7 L | 18. 6 D | 27. 9 L | 36. 3 L |

37. 4 U & R	41. 8 L	45. 2 R	49. 5 L & U
38. 2 R	42. 1 L	46. 9 R	50. 7 U
39. 3 R	43. 5 & 4 D	47. 8 U	51. 6 R
40. 9 U	44. 3 R	48. 1 L	52. 1 D

THE ELEVEN BLOCK PUZZLE

Problem #1 comes first. This solution is rather easy.

1. 5 D & L	13. 4 & 5 U	24. 6 D	35. 1 R
2. 10 U	14. 1 R	25. 4 & 5 R	36. 11 R
3. 11 R	15. 2 R	26. 1 U	37. 10 R
4. 4 & 5 D	16. 3 D	27. 9 U	38. 3 U
5. 10 L	17. 10 L	28. 8 L	39. 2 L
6. 11 U	18. 11 L	29. 7 D	40. 8 L
7. 4 & 5 R	19. 5 L & U	30. 6 D	41. 9 L
8. 1 R	20. 1 U	31. 4 D & L	42. 4 & 5 L
9. 2 D	21. 9 L	32. 7 U	43. 6 L
10. 3 L	22. 8 D	33. 6 R	44. 7 D
11. 10 L	23. 7 D	34. 4 & 5 D	45. 1 R
12. 11 L			

The first forty-one moves of Problem One-A are the same as for Problem One—the rest follow:

41. 9 L	49. 10 D	56. 11 U	63. 9 U
42. 4 L & U	50. 11 L	57. 9 L	64. 8 L
43. 8 R	51. 4 & 5 U	58. 8 D	65. 1 D
44. 9 D	52. 10 R	59. 1 D	66. 5 D & L
45. 4 & 5 L	53. 11 D	60. 4 & 5 R	67. 7 L
46. 8 U	54. 4 L & U	61. 10 U	68. 6 U
47. 9 R	55. 10 U	62. 11 U	69. 1 R
48. 4 D & R			

Problem Two is by far the most difficult of all these block-shifting puzzles. But it can be done, too. Here is one way to do it in one hundred and six moves:

- | | | | |
|-------------|-------------|-------------|--------------|
| 1. 2 D | 28. 11 R | 55. 10 R | 82. 9 R |
| 2. 3 D | 29. 10 D | 56. 1 R | 83. 3 U |
| 3. 9 L | 30. 1 D | 57. 3 D | 84. 2 L |
| 4. 8 U | 31. 4 & 5 L | 58. 2 R | 85. 10 L |
| 5. 6 U | 32. 3 U | 59. 4 & 5 U | 86. 11 L |
| 6. 7 U | 33. 2 U | 60. 3 L | 87. 7 L |
| 7. 4 & 5 R | 34. 11 U | 61. 2 D | 88. 6 L |
| 8. 2 D | 35. 10 R | 62. 4 R & U | 89. 4 & 5 D |
| 9. 3 D | 36. 1 D | 63. 8 L | 90. 1 R |
| 10. 9 D | 37. 4 D & L | 64. 9 D | 91. 8 R |
| 11. 8 L | 38. 2 L | 65. 5 & 4 R | 92. 9 R |
| 12. 6 U | 39. 3 L | 66. 8 U | 93. 3 R |
| 13. 7 U | 40. 9 L | 67. 9 L | 94. 2 U |
| 14. 4 U & R | 41. 8 L | 68. 1 U | 95. 10 L |
| 15. 7 D | 42. 7 U | 69. 10 L | 96. 11 L |
| 16. 6 L | 43. 6 R | 70. 11 D | 97. 7 L |
| 17. 4 & 5 U | 44. 11 R | 71. 7 D | 98. 6 L |
| 18. 7 R | 45. 10 R | 72. 6 D | 99. 4 L & D |
| 19. 6 D | 46. 1 R | 73. 4 & 5 R | 100. 1 D |
| 20. 5 L & U | 47. 4 & 5 D | 74. 1 U | 101. 8 R |
| 21. 9 R | 48. 2 L | 75. 10 U | 102. 9 U |
| 22. 8 D | 49. 3 L | 76. 11 L | 103. 7 U |
| 23. 4 & 5 L | 50. 9 L | 77. 6 D | 104. 6 U |
| 24. 9 U | 51. 8 L | 78. 7 D | 105. 4 & 5 L |
| 25. 8 R | 52. 7 L | 79. 5 D & R | 106. 1 D |
| 26. 2 U | 53. 6 U | 80. 1 R | |
| 27. 3 U | 54. 11 R | 81. 8 R | |

GLOSSARY

SOME of the words below are wood-workers' terms, some are peculiar to games. I have included only those that might be strange to you, and have defined only the meaning that you would not be expected to know. The word "batten," for instance, has several meanings, one of which is to "fatten" and another "to fasten down." It also has a third connotation and that's the one that I've used in the book and defined in the glossary. The same holds true for many of the other words: so here I've explained only the meaning that is used in the book, and only those that would possibly be unfamiliar to you.

ADVANTAGE. In *Tennis*—the point following deuce or 40-40.

AD IN. A short form of ADVANTAGE IN. The score in *Tennis* when the server has the advantage.

AD OUT. A short form of ADVANTAGE OUT. The score in *Tennis* when the receiver has the advantage.

AGGIE. A large glass marble or "agate."

ALLEY-WAY. An open space on the floor, walk, lawn, or driveway suitable to use for playing *Skittles*, *Tenpins* and the like.

APEX. The point or corner of a triangle.

BACK-SAW. A handsaw reinforced and stiffened. Used in making mitre joints.

BASE-LINE. In *Tennis*, etc.—the end lines or tapes of the court.

BATTEN. A strip of wood nailed across two other strips to cover a crack. But used more loosely here to denote a strip nailed or screwed across two or more boards to hold them together.

BEVEL. To cut or sandpaper the edge of a board; to round off the corners. Also the rounded or beveled corner so made.

BIT. A tool used for boring or drilling. Also the cutting edge of a plane-iron.

BOWLINE. A knot formed by making a loop in the end of a piece of rope.

BRACE. A tool used to hold the bit when drilling.

BRAD. A thin wire nail with a rounded head.

CARRIAGE-BOLT. An iron bolt with a round head.

CHALK-LINE. A light, strong cord generally made of twisted cotton.

CHECK. A crack or defect in wood usually caused by faulty seasoning.

COMPASS-SAW. A handsaw with a narrow pointed blade used for cutting curved lines. Sometimes called a KEYHOLE SAW.

COPING-SAW. A fine saw held in a frame similar to a fret-saw.

CROQUET. To drive away your opponent's ball by placing your own ball against his and striking your ball with the mallet.

DART. A small, sharp-pointed, hand-thrown arrow.

DEUCE. In *Tennis*—a score of 40-40, or any tie score above that.

DOUBLES. Used to describe any game in which two players oppose two other players.

DOWEL. A wooden pin made to fit into a hole, or the material from which such pins are made.

DRAUGHTS. The game of *Checkers*. Often, but incorrectly, used to refer to the men used in the game.

DRAW. To leave the winner of a game undecided. Also a game so left.

DRAW-KNIFE. A wood-working tool having a single blade with a handle at each end. Used for shaving or cutting wood.

ESCUTCHEON PIN. A small nail or pin, generally made of brass, and having a round head.

FAULT. In *Badminton*—see page.64.

FINISHING NAIL. A fine nail having a rounded head.

FLASHING. Metal sheeting used to waterproof the joints of a wall or chimney with the roof of a building.

FOUL. A play which does not conform to the rules of the game.

FRAME. In *Bowling*, *Tenpins*, *Skittles*, etc.—an inning.

GROMMET. A rope ring.

GUY. A rope attached to an object to steady it. Also to steady with a guy.

HALF-HITCH. A knot made by passing the free end of a cord or rope around the standing part and back through the loop so formed.

IN. In *Badminton*—a player or a team is said to be “in” when that player or team is serving.

INNING. The turn of a person or a team in a game.

JUMP. In *table games* such as *Checkers*, etc.—to move a counter over another into the adjacent square.

KEYHOLE-SAW. A COMPASS-SAW.

LAG-SCREW. A heavy metal screw having a square or six-sided head.

LEANER. In *Quoits*—a quoit or ring that leans against the stake.

LOVE. In *Tennis*—the score of a player who has gained no points.

MASON'S LINE. A heavy woven cord of about one-eighth inch in diameter.

MITRE. A joint formed by two pieces of wood joined on a line bisecting the angle of junction. Also to make such a joint.

MITRE-BOX. A frame or apparatus for guiding the saw when making a mitred joint.

MOVE. To change the position of a counter in *Chess*, *Checkers*, etc. Also a player's turn to move.

NET-BALL. In *Tennis*, etc.—when the ball strikes the top of the net and continues over into the court it is called a “net-ball.”

OUT.—In *Badminton*—the team or player who is receiving the ball is the “out” side.

PLYWOOD. A sheet of wood made by gluing together three or more sheets of veneer.

POUND. In *Nine Men's Morris*—to remove a counter from the board according to the rules of the game.

RALLY. In *Tennis*, etc.—a series of strokes ending when one player fails to return the ball.

RECEIVE. In *Tennis*, etc.—to strike or attempt to strike a served ball in order to return it to the server.

RETURN. In *Tennis*, etc.—to make a successful stroke, to drive the ball back over the net to the opponent's court.

RINGER. In *Quoits*, etc.—a quoit or ring so thrown that it falls over the stake.

ROVER. In *Croquet*—a ball that has passed through all the arches and would go out if it hit the stake. Also the person playing such a ball.

SASH-CORD. A heavy cotton cord usually woven and usually about $\frac{1}{4}$ " in diameter.

SERVE. In *Tennis*, etc.—to put the ball into play by delivering it to the opponent.

SERVER. In *Tennis*, etc.—the player who serves.

SERVICE. In *Tennis*, etc.—the act of serving. Often called the “serve.”

SINGLES. Used to describe nearly any game in which one player opposes another.

SIZE. To treat canvas or wood so that the painted design will not blur or run into the grain or fabric.

SLEEVE. A metal tube used as a bearing for a moving rod.

SPARE. In *Tenpins*, *Skittles*, etc.—the act of knocking down all the pins with two balls or disks.

SPLICE. To fasten two ropes together by interweaving the strands or yarns.

SPOKESHAVE. A tool used in woodworking, with a blade like a plane and a handle at each side, for planing curved surfaces.

STRIKE. In *Tenpins*, *Skittles*, etc.—the act of knocking down all the pins with one ball or disk.

STRING. In *Bowling*, *Tenpins*, etc.—ten frames.

TAKE. In *Checkers*, etc.—to remove an opposing man from the board according to the rules of the game.

TEE. A small, wooden, large-headed pin used in golf.

veneer. A thin sheet of wood. Also, though incorrectly, used for three such sheets glued together to form plywood.

VOLLEY. In *Tennis*, etc.—to return the ball before it strikes the ground.

WALL-BOARD. A composition material generally used in the place of wood or plaster as the outside surfacing of walls.

YARN. One of the three strands making up ordinary twisted rope.

INDEX

The index is divided into three sections. Under the first section are listed all the games and where to find them. The second section lists the game equipment that can be used in more than one game. The third section is a classification of games, giving the number of players required for a game and whether it is usually played outdoors or in, or on a table.

I

LIST OF GAMES

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Badminton, 60.
Bagatelle, 153; Baseball Bagatelle, 159; La Bagatelle, 166.
Baseball Bagatelle, 159; Baseball Darts, 118.
Black Diamond, 134.
Block Moving Puzzles, 240; see also Puzzles.
Box Hockey, 96; Junior Box Hockey, 102.
Bull Board, 127.
Buzz Ball, 121; Jump Buzz Ball, 125.

Checkers, 183; Four-handed Checkers, 197.
Chess, 188; Miniature Chess, 196.
Cockamaroo, 162.
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Croquet, Disk, 85; Miniature Croquet, 94.
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Tangrams, 237.

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Tenpins, 74; Miniature Tenpins, 81.

Tenpin Toss, 109.

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Twelve Holes, 143; Miniature Twelve Holes, 143.

II

GAME EQUIPMENT

There are many pieces of game-equipment that are used in more than one game. Generally these pieces are described in only one place. Under this section the pieces are listed and the page given where they will be found.

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Scrap Lumber, use of in building games, 22; see also under each game.

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Tools, necessary and unnecessary, 21.

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Workshop equipment, 21.

III

CLASSIFICATION OF GAMES

Under this heading the games are classified according to the place in which they are usually played, and the number of players. Of course, all the outdoor games can be played indoors if you have enough room, and all the indoor games can be played outside. The table games can be played on the floor, if you wish, but generally speaking, table games are played on a table, and so on. Most of the games listed as group games can be played by two or three or four players. But the opposite does not hold true: games that require a limited number of players can be played

only with that number. Puzzles are not included in this classification. They are essentially solitaire games, and you can play them anywhere you wish, in bed or in a street-car.

Several games are listed in more than one place. Some of them, like Shuffleboard, have three different versions, one for outside, one for in and one for the table. Others, like Hand Tennis, are listed twice because the same game is just as good inside as out. The table games are in two sections: the first you might call athletic, and the second, brain.

OUTDOOR GAMES

Badminton, 60.	Ring Volley Ball, 57.
Box Hockey, 96.	Shuffleboard, 25.
Deck Tennis, 54.	Skiddles, 82.
Fives, 59.	Skiddle Toss, 109.
Hand Tennis, 58.	Skittles, 74.
Nine Holes, 137.	Tenpin Toss, 109.
Paddle Tennis, 43.	Tether Ball, 67.
Quoits, 112.	Twelve Holes, 143.
Ring Tennis, 54.	

INDOOR GAMES

Baseball Darts, 118.	Hand Tennis, 58.
Black Diamond, 134.	Indoor Quoits, 112.
Bull Board, 127.	Nine Holes, 137.
Buzz Ball, 121.	Ringtoss, 104.
Croquet, Disk, 85.	Shuffleboard, Junior, 34.
Darts, 115.	Table Tennis, 145.
"Do-Do," 108.	Tenpins, 74.
Exo, 127.	Tether Ball, Miniature, 72.
Fives, 59.	Twelve Holes, 143.

TABLE GAMES

1

- | | |
|------------------------------|-------------------------------|
| Bagatelle, 153. | Nine Holes, Miniature, 137. |
| Baseball Bagatelle, 159. | Shuffleboard, Table, 37. |
| Box Hockey, Junior, 102. | Skittles, Miniature, 81. |
| Cockamaroo, 162. | Table Tennis, 145. |
| Croquet, Miniature Disk, 94. | Tenpins, Miniature, 81. |
| La Bagatelle, 166. | Twelve Holes, Miniature, 143. |

2

- | | |
|-----------------------------|-------------------------|
| Backgammon, 186. | Four-up, 206. |
| Checkers, 183. | Fortyniner, 219. |
| Checkers, Four-handed, 197. | Go-ban, 206. |
| Chess, 188. | Halma, 208. |
| Chess, Miniature, 196. | Nine Men's Morris, 215. |
| Five-in-a-Row, 202. | |

GAMES FOR A LIMITED NUMBER OF PLAYERS

- | | |
|--------------------------------|----------------------------------|
| Backgammon, 186; 2. | Fortyniner, 219; 2. |
| Badminton, 60; 2 or 4. | Four-up, 206; 2 to 4. |
| Box Hockey, 96; 2. | Go-ban, 206; 2 to 4. |
| Checkers, 183; 2. | Hand Tennis, 58; 2 or 4. |
| Checkers, Four-handed, 197; 4. | Halma, 208; 2 or 4: 214; 3 or 6. |
| Chess, 188; 2. | Indoor Quoits, 112; 2 or 4. |
| Cockamaroo, 162; 2. | Nine Men's Morris, 215; 2. |
| Croquet, Disk, 85; 2 to 6. | Paddle Tennis, 43; 2 or 4. |
| Deck Tennis, 54; 2 or 4. | Ring Tennis, 54; 2 or 4. |
| Five-in-a-Row, 202; 2 to 4. | Table Tennis, 145; 2 or 4. |
| Fives, 59; 2 or 4. | Tether Ball, 67; 2. |

GAMES FOR GROUPS

- | | |
|---------------------------------------|-----------------------|
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| Baseball Bagatelle, 159; even number. | Nine Holes, 137. |
| Baseball Darts, 118; even number. | Ringtoss, 104. |
| Black Diamond, 134. | Ring Volley Ball, 57. |
| Bull Board, 127. | Shuffleboard, 25. |
| Buzz Ball, 121. | Skiddles, 82. |
| Buzz Ball, Jump, 125. | Skiddle Toss, 109. |
| Darts, 115. | Skittles, 74. |
| "Do-Do," 108. | Tenpins, 74. |
| Exo, 127. | Tenpin Toss, 109. |
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